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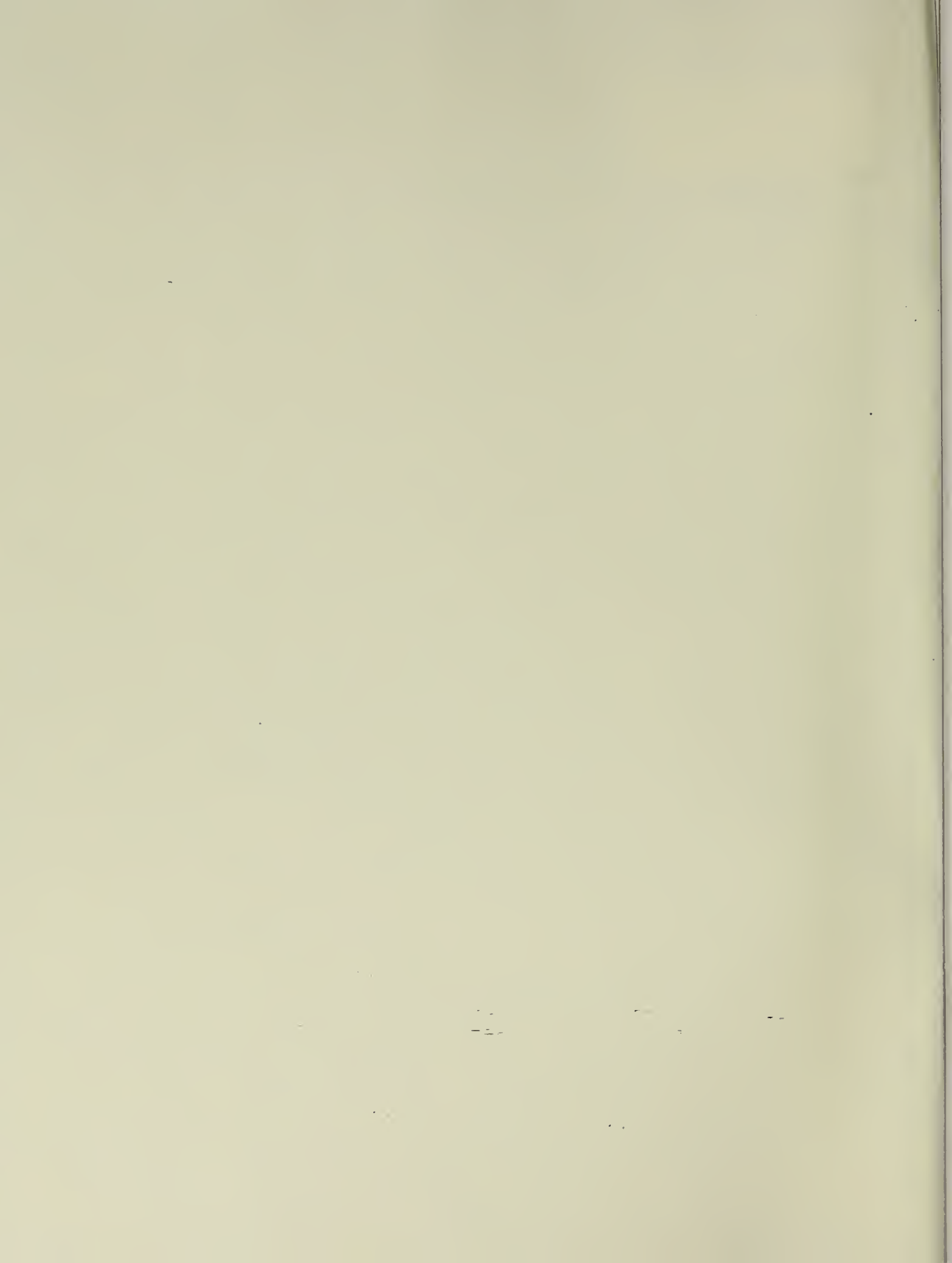


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THE 1991 DEDHAM OPEN SPACE AND RECREATION PLAN



The Carr Bridge
Dedham
November 1991



ACKNOWLEDGEMENTS AND CREDITS

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Original Research

**Human evolution and the
origin of the modern human
race: a review of the evidence
from the fossil record and
molecular biology**

by **Professor P. V. K. ...**

The origin of the modern human race is one of the most important questions in human evolution. This paper reviews the evidence from the fossil record and molecular biology. The fossil record shows that the modern human race originated in Africa about 200,000 years ago. Molecular biology shows that the modern human race is a single species, Homo sapiens, and that all modern humans are descended from a common ancestor in Africa.

Abstract

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SECTION I - PLAN SUMMARY

A. GOALS FOR THE OPEN SPACE AND RECREATION PLAN

The impetus for undertaking this open space and recreation planning effort is the realization that the supply of open land in Dedham is rapidly disappearing. The town is under significant growth pressures due in part to its location and excellent highway access. There is increased awareness in the town that action must be taken now before all the open land disappears.

The major goals of the open space and recreation plan are:

- o To Preserve the Character of the Town.
- o To Protect Open Land.
- o To Protect Natural Resources.
- o To Provide Recreational Opportunities for All Residents.
- o To Manage Existing Recreation and Conservation Lands.
- o To Increase Public Awareness and Support of Open Spaces.
- o To Review Town Bylaws, Policies and Regulations to Determine their Impact on Open Space Preservation, and Recommend Modifications Supportive of Open Space and Recreation Goals.

B. MAJOR RECOMMENDATIONS

Section IX of the plan is the Five Year Action Plan. This is a comprehensive list of specific actions which are designed to achieve the plan's stated goals (see Section VIII for detailed discussion). The major recommendations of the plan include:

- o Establish a permanent open space committee. It should be appointed by the Moderator, and have a structured membership, including representatives from the Planning Board, Conservation Commission, Recreation Department, as well as members with specific areas of relevant expertise.
- o Institute adult recreation programs and study the feasibility of establishing user fees.

- o Meet with major institutions to review their long-term plans.
- o Study re-use of the railroad ROW.
- o Enforce existing environmental regulations.

SECTION II - INTRODUCTION

A. STATEMENT OF PURPOSE

The Town of Dedham is under significant growth pressures due to its location and excellent highway access. The character of the town has always been a source of pride for its residents. As development increases and open land disappears, the town's residents are aware of the need to act now to preserve the town character and sufficient open land to meet the needs of its current and future population. To this end, the town has undertaken to prepare a full open space and recreation plan.

One of the earliest efforts at planning for open space and recreation was the 1947 Master Plan and Report done by Arthur and Sidney Shurcliff, Town Planners. This report included ten pages on recreation and open space. The 1967 General Plan for the town of Dedham, prepared by Candeb, Fleissig and Associates, Consultants, also addressed open space and recreation needs. As development increased and open land disappeared, the conservation commission recommended to the Selectmen that an open space committee be formed to oversee the development of an open space and recreation plan.

Although commercial development is critical to the economic health of a community, unplanned and poorly designed development has many negative impacts on a community. The citizens of Dedham are looking to achieve a balance between necessary growth and maintaining the residential character of the town. The town is aware of the need to preserve the Charles and Neponset rivers as a local and regional resource. Groundwater protection is recognized by most citizens to be critical to Dedham's future. The recreational needs of the community are also an important part of the vision for the future. The residents do not want to see wall-to-wall development and are aware that the supply of open land is rapidly dwindling and the time to act is now.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

The planning process got underway when the Dedham Open Space Committee was appointed by the Board of Selectmen in December, 1988. The town conservation administrator had begun work on an open space and recreation plan. In the winter of 1989, the town contracted with the Metropolitan Area Planning Council (MAPC) for technical assistance in preparing the plan. Joan Blaustein of the MAPC was the principal researcher and author of the plan. This planning effort was funded, in part, by a grant from the Norfolk-Plymouth Conservation District.

The League of Women Voters has also been active in open space issues. The League held an open space forum in September, 1989. A survey was distributed at that forum, to obtain input from residents on open space and recreation needs in Dedham.

In order to obtain additional citizen input, The Dedham Open Space Committee distributed a survey at the April 9, 1990 Town Meeting. The results of this survey are discussed in Chapter 7.

THE DEDHAM OPEN SPACE COMMITTEE

Jennifer Egan, Recreation Commission
Robert Hanson, Historic Districts Commission
Anthony Mucciaccio, Recreation Commission
Rose Netzer, League of Women Voters
Robert Sinclair, Conservation Commission
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SECTION III - COMMUNITY SETTING

A. REGIONAL CONTEXT

Dedham is the county seat of Norfolk County. It is bordered by Needham on the west, Boston on the northeast and east, Canton and Westwood on the south. Dedham shares several important resources with surrounding communities. These include the Charles and Neponset rivers as well as sharing a common water system (the Dedham-Westwood Water District) which utilizes wellfields in both Dedham and Westwood.

The original settlers of Dedham were primarily farmers. Dedham's early development was also influenced by its location on the Charles and Neponset rivers. The need for a corn mill prompted the town, in 1638, to offer 60 acres of land to Abraham Shaw to erect and operate such a mill, although the actual construction was finally effected by John Elderkin in 1642, near the point where Bussey Street crosses Mother Brook. The Boston and Providence Railway came to Dedham in 1835, and opened the way for the development of even more industries than those dependent on water power. Workers were needed for the new factories, and the economy of the Town became more diversified as the old farm lands gave way to residential uses.

The character of the town has continued to evolve with the construction of Route 1 and Route 128. Very little of the land is used for agriculture now. The town's proximity to Boston adds to the demand for housing and in spite of the slight decline in population the home building activity continues. There is a small amount of industry in the southern section of the town. The demands for housing as well as extensive retail development have created significant pressure on the remaining open space.

The commercial areas, mostly retail enterprises, stretch along Route One through the center of town. Some commercial activities still exist in the Dedham and East Dedham Square areas and local businesses provide services in other neighborhood centers.

B. HISTORY OF THE COMMUNITY

In September of 1635, the General Court of Massachusetts Bay Colony responded to a growing concern generated by the departure of settlers from the thin line of towns hugging the seacoast around Boston, and their subsequent migration into Connecticut. This loss of population was a clear threat to the survival of the whole Colony, and the proposed solution was to establish two inland towns, closer to Boston, whose lands were to be granted outright to carefully selected groups of proprietors. Concord, on the Musketaquid River, was to be one, and an initially anonymous "plantation...about two miles above the falls on the Charles

River, on the northeast side thereof, to have ground lying to it on both sides of the river, both upland and meadows..." was to be the other, eventually to be named Dedham. In March of 1636, the Court ordered the bounds to be "set out" for that second grant.

The Proprietors of the Dedham Grant had been selected, and were already holding meetings by August of 1636; the following month they petitioned the General Court for an enlargement of their land allotment, requesting the addition of "all the land that is left out of former grants upon that side of the Charles River...and upon the other side five miles square..."

The General Court quickly agreed to allocate "all that land on the easterly and southerly side of the Charles River not formerly granted unto any town or particular person... and also to have five miles square on the other side of the river." The southern boundary of Massachusetts Bay Colony was, according to the Colony Patent, located three miles south of the Charles River "or on any or every part thereof" - the problem being that nobody had ever thoroughly explored the Charles River, and nobody knew to a certainty just where it went. In modern terms (the exact boundary having finally been legally established by a Supreme Court decision of 1846), Dedham's original grant encompassed about 200 square miles of territory stretching from Weston to Plymouth Colony and Rhode Island, and to Blackstone and Mendon. Figure III-A shows the original Dedham grant.

Over time, this tremendous land area was whittled down by the secession of satellite settlements that had been developed within the original bounds of the grant. Various other small parcels of territory came and went from Dedham over the years. Important to note are the 1738 agreement with Stoughton (now Canton) which carried the Town's eastern boundary to the midline of the Neponset River, and the 1868 surrender of heavily-developed Readville which reduced Dedham by one-tenth of her population and one-twentieth of her land.

The first houselots were laid out along High Street (a new road) and East Street (a pre-existing Indian Trail), allotted on a ratio which guaranteed each married man 12 acres for a houselot and each single man 8 acres. Additionally, each proprietor was allotted meadow land and swamp in proportion to his homelot grant.

The well-watered nature of the Dedham site is still self-evident; the Charles River has not materially changed in its meandering path since the settlement period. What may not be so evident is the manipulation which the subsequent generations have inflicted upon the Town's waterways.

One of the earliest needs of the new community was for a mill, of sufficient capacity to handle the Town's production of corn, wheat, barley

and rye. The river, for various reasons, was an inappropriate source for water power for a mill, and "East Brook" had adequate fall, but insufficient water volume. Accordingly, in 1640, the settlers dug a canal ("Mother Brook") from the Charles River to East Brook, diverting a portion of the former's flow into the latter's channel, thereby creating more-than-adequate supply for the mill which was almost immediately erected. Later, as other mill privileges were established on Mother Brook, the right of the millers to draw off up to one third of the flow of the Charles River was established by statute.

In a less commercial context, the settlers found another canal to be a necessary project for flood control and preservation of the riverbank meadows. The Charles River (which, in the settlement period was still clogged with the vegetable detritus and the various obstructions generated in the eons preceding) runs for many miles in a nearly due east direction, comes into Dedham and turns abruptly toward the southeast. It then turns north toward Cow Island Pond, and then northwest to a point only some 3,300 feet from where it started its sweep- a total run of some seven or eight miles within Dedham, but achieving a total fall of less than three feet! Obviously, any obstruction sufficient to cause a backup of flow in the river anywhere along that meandering path resulted in the waters overspreading tremendous areas of meadow adjoining. The 4,207.5 foot "Long Ditch" was dug in 1652 to channel water, directly and expeditiously, from the high side of the river, cross-country to the low side.

"Dwight's Brook" or the "Little River" was a major waterway which connected the Wigwam Pond drainage area with the Charles River, intersecting the primary routes of travel at High and East Street. Initially this stream provided nourishment for adjoining grasslands (the "Little Meadows") which were important pasture areas. Troublesome in its tendency to flood, thereby interrupting travel on the primary roads, this stream was much-manipulated in its channeling over time, and has now been almost completely piped; it now plays little part in the surrounding ecology.

In 1651, Edward Johnson, author of Wonder Working Providence of Zion's Saviour in New England noted that Dedham was

an inland Town...well watered with many pleasant streams, abounding with garden fruits fitly to supply the markets of Boston, whose coin and commodities allures the inhabitants... to make many a long walk;...they have changed the close, clouded woods into goodly cornfields, and added much comfort to the lonesome travellers, in their solitary journey to Connecticut...

That same description could have appeared, with only minor modification, and been completely in tune with the situation at almost any point in the ensuing 150 years. Dedham was a farming town, independent, largely self-sufficient, and not much given to innovation. Her continuing concerns were her orchards and her success in raising of livestock. After 1790 or so, however, things began to change - gradually at first, but with a perceptible acceleration

Dedham's Samuel Colburn had died of camp disease near Saratoga, New York, on his way home from the Crown Point Expedition of 1756. Sam, (highly unusual for Dedhamites) was an Episcopalian, and he bequeathed his entire farm (including a large part of what is now Dedham Square) to the Dedham Episcopal Church, reserving only a life interest for his mother. When the old lady finally died in 1792, the then Rector of the church began dividing up the property into streets and houselots, to be rented out, under the authority of a special act of the Legislature, on 999-year leases. The first street laid out under this program was Church Street, which thus became the first urban street in Dedham, in the sense that it was intended to be bordered by houselots rather than serve merely as a passage between isolated farms. Figure III-B shows the Colburn lands.

By 1801, the First Church in Dedham, viewing the success of the Episcopalian land scheme, began setting out and renting lots on its own property.

In that same year, the State of Massachusetts took a census of farms and manufactories. Dedham (then still including Norwood and Westwood) boasted in 1801:

- 636.75 acres of tillage/orchard tillage
- 1195 acres of mowing (English/orchard/upland)
- 1800 acres of fresh meadow
- 4147.5 acres of pasturing
- 3466.5 acres of unimproved land
- 1968 acres of unimprovable land

Cultural and economic change was also beginning, for that same census also noted:

- 4 grist mills
- 13 small (probably family) mills
- 1 fulling mill
- 15 shops
- 3 tanneries
- 6 slaughterhouses
- 1 pot/pearl ash works
- 2 bakeries

Coincidental with - and an encouragement to - the development of the church lands and the advent of small businesses was the designation of Dedham as the County Seat for the new County of Norfolk in 1793. A handsome new Court House was erected in 1795, and the court trade provided an incentive for the expansion of the local tavern trade, with at least four in operation by 1805. In 1803 the Norfolk and Bristol Turnpike was opened for business through Dedham Center, and in 1804 the Hartford and Dedham Turnpike came along, utilizing some of the same streets. Stagecoach service suddenly became easily available to Boston, Providence and Hartford.

Down at Mother Brook, the old corn mill of the first settlement had been joined by paper mills, wire mills, sawmills, and by 1810, woolen and cotton mills. Artisans and specialists began to wend their way out from Boston, to ply their trades in the growing community.

The non-agricultural population, meanwhile, was quickly achieving a much larger share of the trade and commerce of the community. By 1845, the Town's manufactories employed more than 650 people, producing such varied goods as cotton, cotton thread, woolens, silks, brooms, furnaces, shovels and hoes, paper, chairs and cabinets, tinware, sheet iron, boots, shoes, saddlery, cigars, pocket notebooks, carriages and coaches, and marbled papers.

The coming of the railroad in 1835 essentially put the last nail in the coffin of Dedham's agricultural interests. Some farms held out for a long while on a self-sufficiency basis (their ability to compete in the Boston market being very limited), but it was an ultimately futile contest - the availability of convenient transport for raw materials and finished goods provided an irresistible incentive for the enhancement and diversification of the Town's manufacturing interests. The same availability of convenient, reliable transportation permitted wealthier individuals to assemble "country seats" in Dedham, and to develop estates where their families could live in the relative splendor and bucolic beauty that befitted their social station, while the breadwinner could comfortably commute to Boston to attend to business.

The old Dedham farming interests gave way, grudgingly, but inexorably, to the new interests of entrepreneurs and day workers. Figure III-C shows the earliest subdivisions. The Elmwood Land Company bought the old Farrington Farm and began laying out houselots around 1867, ultimately assuming the district name of Endicott (map reference #2). The Whiting Farm became Oakdale in 1871, the Turner/Whiting tract became Ashcroft in 1873 (map reference #6). By 1910, the ancient Bullard holdings around Wigwam Pond had become Fairbanks Park (map reference #1) and the Bingham Farm on Dedham Island had become Charles River Heights and Charles River Terrace (map reference #7). The Sprague Farm became "the Manor" (map

reference #3) and, in the early 1950's, the Smith Farm became Greenlodge Estates.

Curiously, the sale of farmland by old Dedham families was generally made to outside buyers, investors, and developers - the 1885 tax list indicates that not one lot in the Elmwood development (among either the 35 which had been sold or the residue remaining with the development company) belonged to a Dedham resident; owners/investors were to be found as far away as Bristol, Connecticut. Other social forces were also evident, as Dedham attracted ethnic groups out from the city - the Irish already has a strong foothold by the time of the Civil War, but the Italians (settling at the Washington Street end of East Street) quickly developed a strong community, and the Germans created another ethnic enclave in East Dedham, at what we would today call a "planned community" known as the German Quincy Homestead (Figure III-C, #5), abutting the somewhat more nebulous area called "Germantown".

The availability of work at the East Dedham mills and other manufacturing enterprises was a clear attraction to outsiders wishing to settle in Dedham, as was the ready railroad and streetcar access to other areas of metropolitan Boston where employment was also available. Dedham industries (particularly the mills), however, faltered and failed after the First World War, and the next wave of development had to wait for the advent of the new Route 128 in the early 50's.

Improved automobile/truck access via 128 brought new businesses (Hersey-Sparling, Rust Craft Greeting Cards, etc.), and made Dedham residency more attractive to white collar workers who found employment in the new high-tech firms springing up along "America's Technology Highway."

Although the immediate impact was a spate of housebuilding to accommodate these new middle-class professionals, the indirect effects included an increasing tendency to maximize investment by developing increasingly marginal land areas. Wetlands were compromised (and in some cases, destroyed) at an increasing rate, and the Town was suddenly saddled with an implied responsibility to address drainage and sewage problems related to buildings which perhaps, never should have been allowed to be built in the first place.

Land along Routes 1 and 128 was almost completely developed by the late 1970's, and a few remaining parcels which had suffered a temporary reprieve due to wetlands difficulties were developed by the mid-80's. Strip malls and shopping centers were sited to border the main roads, contributing to traffic problems which increased throughout the town. East Dedham underwent a program of urban renewal, which destroyed the historical context, but resulted in a streetscape which is indicative of both Dedham's lost image as an exurb, and her new status as a fully-developed inner suburb.

Figure III - B

The Colburn Lands

BOSTON

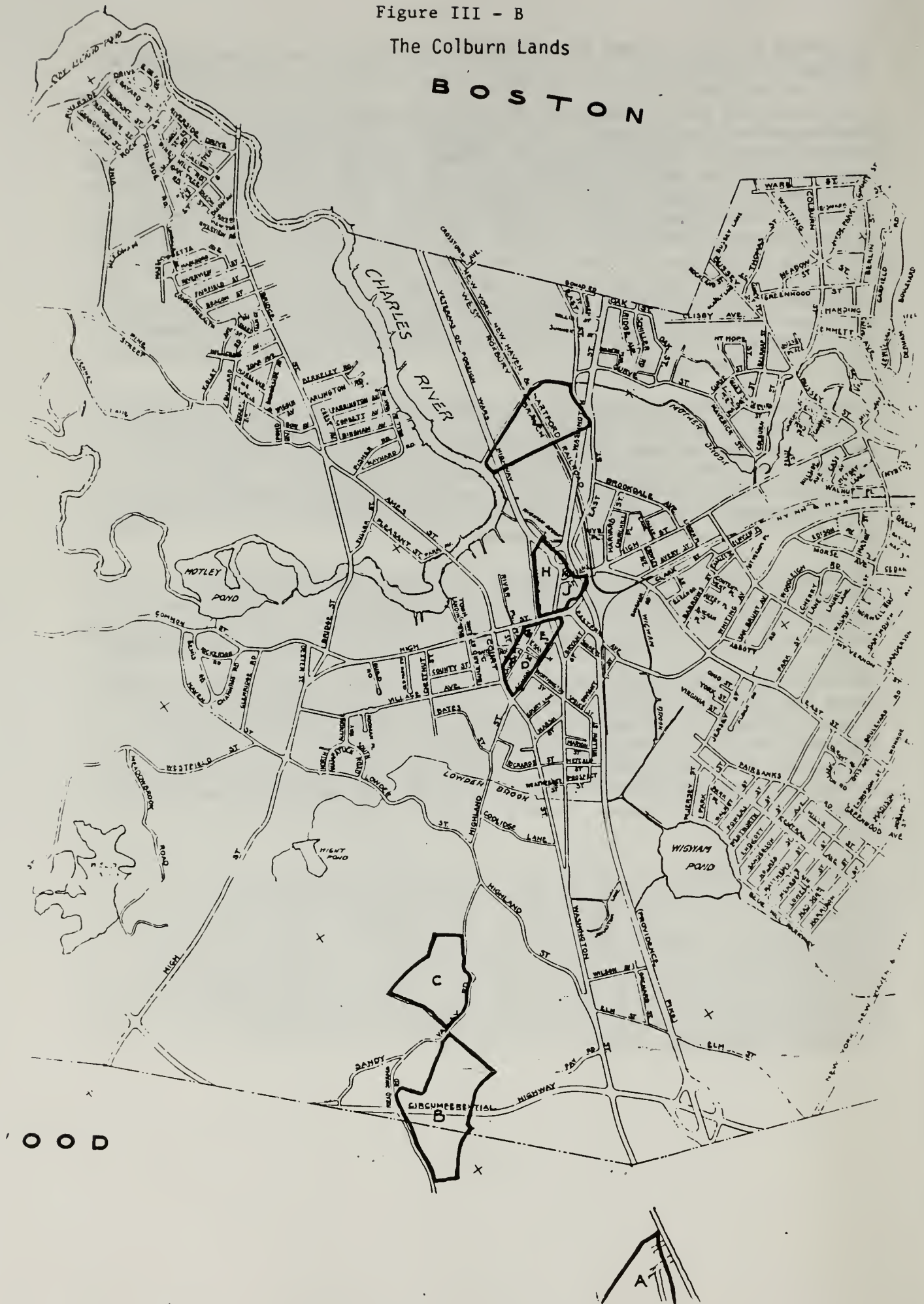


Figure III - C Early Subdivisions

TOWN OF DEDHAM

-MASSACHUSETTS-

E. WORTHINGTON, Engineer

1928

SCALE OF FEET



C. POPULATION CHARACTERISTICS

Past and Present Population - The 1980 population of Dedham, as reported by the United States Census, was 25,298 persons. Figure III-D shows historical population growth in Dedham from 1920 through 1987. Population peaked in 1970 at 26,938 persons. From 1970 to 1980, the rate of population decrease was approximately 6% and from 1980 - 1987, the rate of decrease was roughly 8%. The 1989 town census shows a population of 23,157 persons. The preliminary 1990 Census figures for Dedham indicate a population of 23,673.

The 1980 population had a median age of 33.3 years. There were 6,571 families, including 370 single-parent families with children. The population in 1980 was 98.9% white. The number of persons per household was 3.0. The ethnic-racial composition of the town included a total of 70 blacks, 3 American Indians, 134 Asians and 130 of Hispanic/Spanish origin. The present minority totals are probably much higher. Of the total population, 53.7% identified with the single-ancestry group. The six leading groups were IRISH (37.4%); ITALIAN (23.5%); ENGLISH (11.9%); GERMAN (4.3%); SCOTTISH (2.9%); POLISH (2.8%).

Population Density - Based on the town census total of 23,256 and the town's area of 10.68 square miles, Dedham had a population density of 2,178 persons per square mile in 1987.

Projected Population - The most recent population projections prepared by MAPC show a population of 24,300 holding steady through 2010. Population projections by the Massachusetts Institute for Social and Economic Research (MISER) for 1995 show a population of only 21,795. Figure III-E shows the projected population by age groups for 1990 and 1995 according to MISER. In 1990 and 1995, the age group with the highest percentage of individuals will be 30-39. The percentage will increase by 1995 to 17.75% of the population. By 1995, the age group with the next highest percentage will be the 40-49 year olds.

By 1995, the target year for this five year plan, 22% of the population will be 0-19, 44% will be 20-49 and 34% will be over 50 years of age. If the MAPC projected population of 24,300 is realized, the age distribution may change. Taking the MISER projections as a reasonable estimate, recreation facilities should be geared towards the 20-49 year old group. However, long-range planning (beyond the scope of this five year plan) should take into consideration the general trend towards the aging of the population. As the 1990 Census results become available, the town will need to review the population characteristics to determine if any new trends are discernible. Particular attention should be paid to the number of single parent families and the elderly population. An increase in single parent families would point to the need for after-school recreation programs and additional summer programs.

Personal Income - The per capita income in 1979, the latest year for which US Census data are available, was \$8,454. Median household income was \$22,337 as compared to \$18,694 for the Boston SMSA. Median family income was \$25,149. Five percent of the population had 1979 incomes below the poverty level as compared to 9.4% for the Boston SMSA.

Employment - The 1980 Census indicated that the employed civilian labor force consisted of 13,135 persons 16 years or older. This represented 66.3% of all individuals 16 years or older. The civilian labor force was 55.1% male and 44.9% female.

Table III-A shows employment by industry sector for the 1980 census. The highest percentage of employment was in the retail trade sector. The second highest category was in manufacturing durable goods.

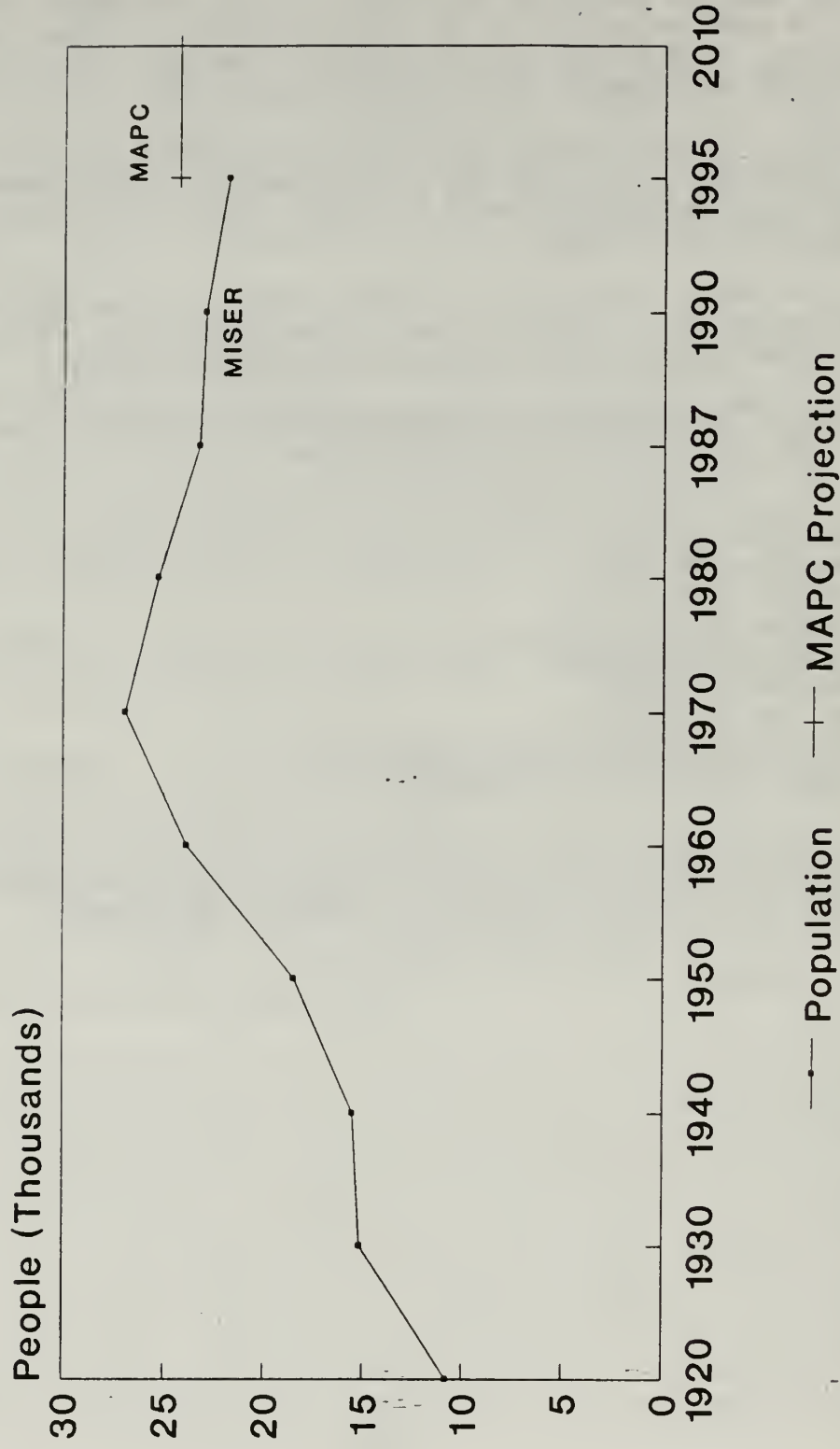
According to the Directories of Massachusetts Manufacturers and Services (1990), the largest employers in Dedham are:

Teledyne Philbrick
American Red Cross
Baybank Norfolk Co.
Cummins North Atlantic
Jackson Construction
Minutemen Transit
National Amusements
Norfolk-Dedham Mutual Fire Insurance
Dedham Institution for Savings

It should be noted that the only true manufacturing enterprises in the above list are Teledyne Philbrick and Cummins North Atlantic.

DEDHAM POPULATION

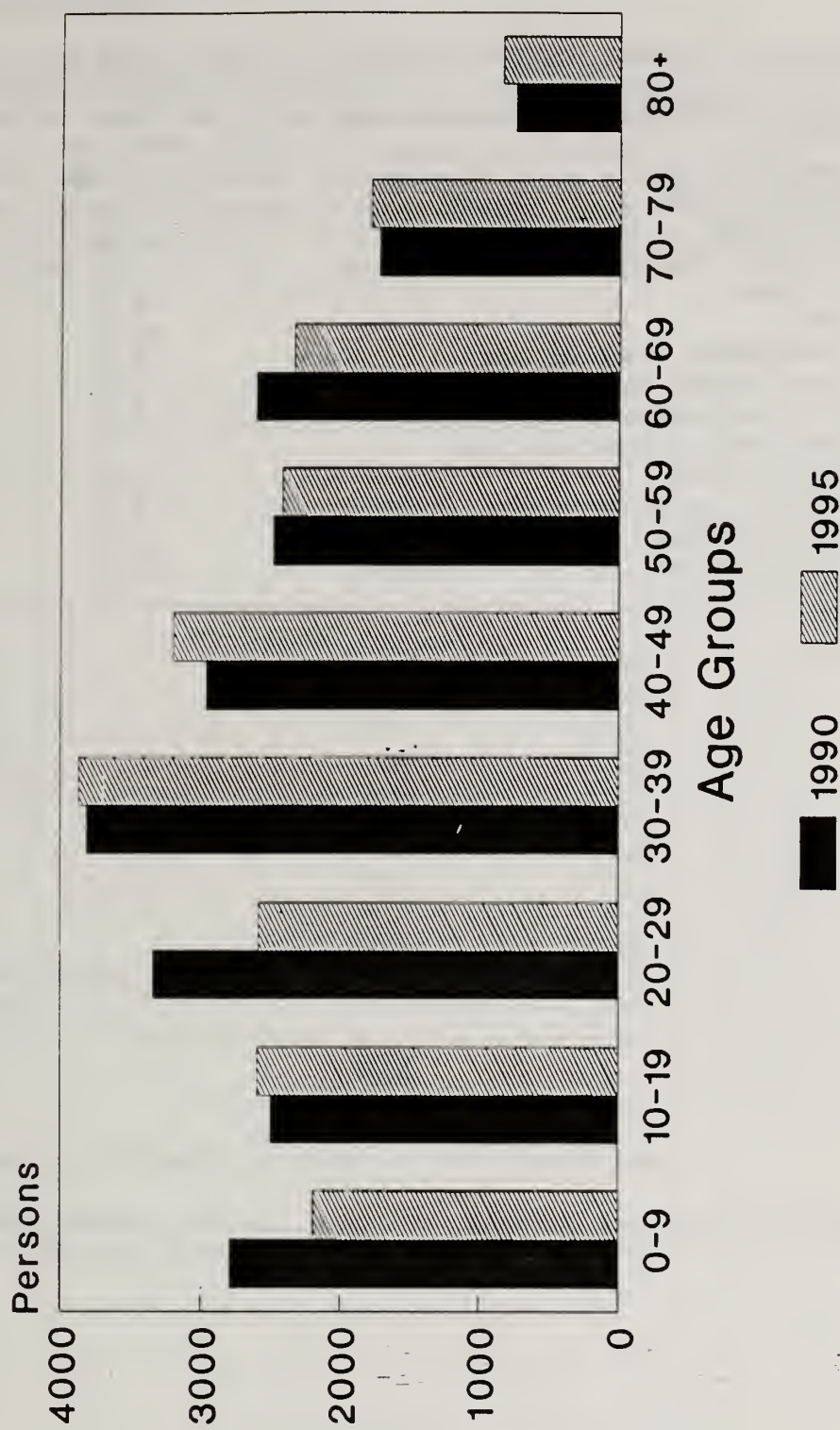
1920 - 2010 Fig. III-D



Sources: U.S. Census, Town, MAPC, Mass. Institute Social and
Economic Research (MISER)

POPULATION PROJECTIONS

BY AGE - Fig. III-E



Source: Mass. Institute for Social and Economic Research

TABLE III-A
EMPLOYMENT BY INDUSTRY FOR PERSONS 16 YEARS AND OLDER

INDUSTRY	%
Agriculture, forestry, fisheries, mining	.36
Construction	4.5
Manufacturing	
Non-durable goods	7.2
Durable goods	11.5
Transportation, communications, utilities	7.9
Wholesale trade	4.9
Retail trade	20.0
Finance, insurance, real estate	7.7
Business and repair services	4.2
Personal, entertainment, recreation	3.7
Professional and related services	
Health services	8.6
Educational services	7.3
Other professional and related services	4.5
Public administration	7.4

Source: 1980 U.S. Census

D. GROWTH AND DEVELOPMENT PATTERNS

1) Patterns and Trends

Between 1951 and 1985, the land developed for residential, industrial and commercial uses increased significantly. This corresponds with the construction of Route 128. Residential development increased by 328 acres and industrial and commercial development by 213 and 244 acres, respectively. This period saw a substantial loss of wetlands (502 acres) as well as a loss of 317 acres of agricultural lands. Table III-B shows the changes in land use over a 34 year period. Figure III-F is a map of land use in 1985.

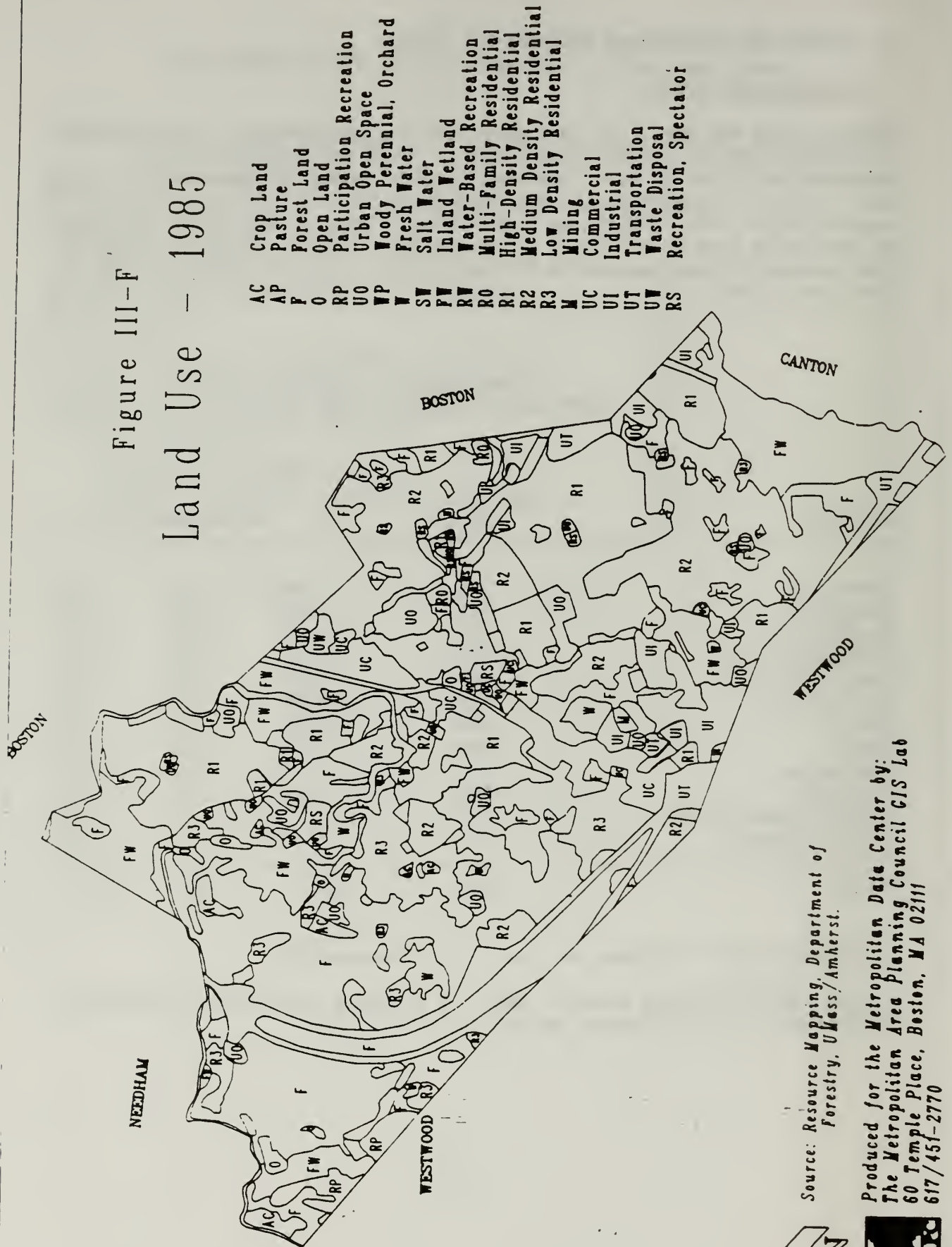
TABLE III-B
LAND USE IN 1951 AND 1985

LAND USE	1951		1985	
	ACRES	%	ACRES	%
Industrial	6	.09	219	3.20
Commercial	59	0.86	303	4.44
Residential	2272	33.01	2600	38.10
Transportation	230	3.38	363	5.50
Open and Public	201	2.90	250	3.66
Agriculture	387	6.00	70	1.02
Open	240	3.50	44	0.64
Forest	1889	27.66	1776	26.00
Recreation	*	*	139	2.03
Wetlands	1546	22.60	1044	15.11
Mining (Gravel Pits)	*	*	7	0.10
Waste Disposal	*	*	15	0.20
TOTAL	6830	100	6830	100

* Not applicable; category not used in 1951 statistics.

Source: Remote Sensing Project, Dept. of Forestry and Wildlife Management, University of Massachusetts, Amherst.

Figure III-F
Land Use - 1985



Source: Resource Mapping, Department of
Forestry, UMass/Amherst.

Produced for the Metropolitan Data Center by:
The Metropolitan Area Planning Council GIS Lab
60 Temple Place, Boston, MA 02111
617/451-2770



2) Infrastructure

a) Transportation - Route I-95 (128) swings around the western and southwestern periphery of Dedham and provides a fast and convenient access to areas to the north and south. The heavy volume of traffic from surrounding towns and the fact that the highway intersects two important rail lines have attracted the attention of developers and the MBTA. Plans are being considered to provide transportation interchanges for the region which feeds into Route 128.

Local traffic makes use of Route 1A which connects the Dedham Rotary near the center of Dedham with towns to the south. Two other routes which bisect Dedham have lost much of their quiet country road charm as adjoining towns to the southwest and northwest have grown and traffic volumes on both 109 and 135 have increased- especially during the commuter rush hours.

Railroad service from Boston to New York and points south and west is available at the Route 128 station. The same facility provides commuter service for Dedham and many surrounding towns. The Franklin Line connecting Boston with towns to the southwest stops at Endicott station and the Dedham Corporate Center.

An MBTA bus to East Walpole connects points along Washington Street and provides service to the Dedham Mall from the Forest Hills Station in Boston. The Hudson bus line, with a subsidy from the town, maintains a limited local schedule.

b) Water - Dedham is served by the Dedham-Westwood Water District. This water district relies solely on groundwater from ten wells. Five of the wells are located in Dedham at Bridge Street and an additional well is currently being developed in the Fowl Meadow section of Dedham. The 1987 average day demand for water in Dedham was 2.67 MGD (million gallons per day). This is projected to increase to 3.13 MGD by 2020. The current maximum day demand is 4.15 MGD.

c) Sewer - Ninety-percent of the population in Dedham is served by the Massachusetts Water Resources Authority (MWRA) system. The remaining 10% of the population is served by on-site septic systems.

3) Long-Term Development Patterns

a) Land-Use Controls - There are eight zoning districts in the town of Dedham:

Single Residence A
Single Residence B
General Residence

Administrative and Professional
Local Business
General Business
Limited Manufacturing, Limited Manufacturing B
Flood Plain

The single residence A allows one detached house on a 40,000 square foot lot. The lot size in single residence B is 12,500 square feet. The General Residence district allows two-family houses, row houses of 3-8 units and government subsidized apartment houses. The Administrative and Professional District allows single-family homes as well as professional offices. The Local Business district allows neighborhood retail business, services and professional offices. The General Business district allows all types of business and professional establishments. The Limited Manufacturing district allows industrial and warehousing types of uses. Lot coverage ratios range from 30% of the lot in the residential districts to 80% in the local and general business districts.

The Flood Plain district was established to preserve the ground water table, protect public health and safety, and to conserve natural conditions, wildlife and open spaces. The following uses are prohibited (with some exceptions): landfills, damming, buildings or structures and permanent storage of materials or equipment.

The zoning map (Figure III-G) shows the location of the zoning districts. Appendix F shows the Flood Insurance Rate Map which, along with the Neponset River Reservation, is the new definition of the Floodplain District.

A site plan review bylaw was adopted in 1988 which requires review of certain size projects (over 8,000 square feet or more than 30 parking spaces, alterations or additions) adding 8,000 square feet or 30 parking spaces, or smaller projects adjacent to residential areas. Site plan review requires a traffic impact assessment, environmental impact assessment and a community impact assessment. These assessments require that the effect on unique natural features, open space, recreation and wetlands be evaluated.






An Aquifer Protection Overlay Bylaw to protect the Bridge Street Well Field was approved at spring town meeting this year. This bylaw prohibits uses which potentially could pollute the aquifer. Figure III-H shows the extent of this district.

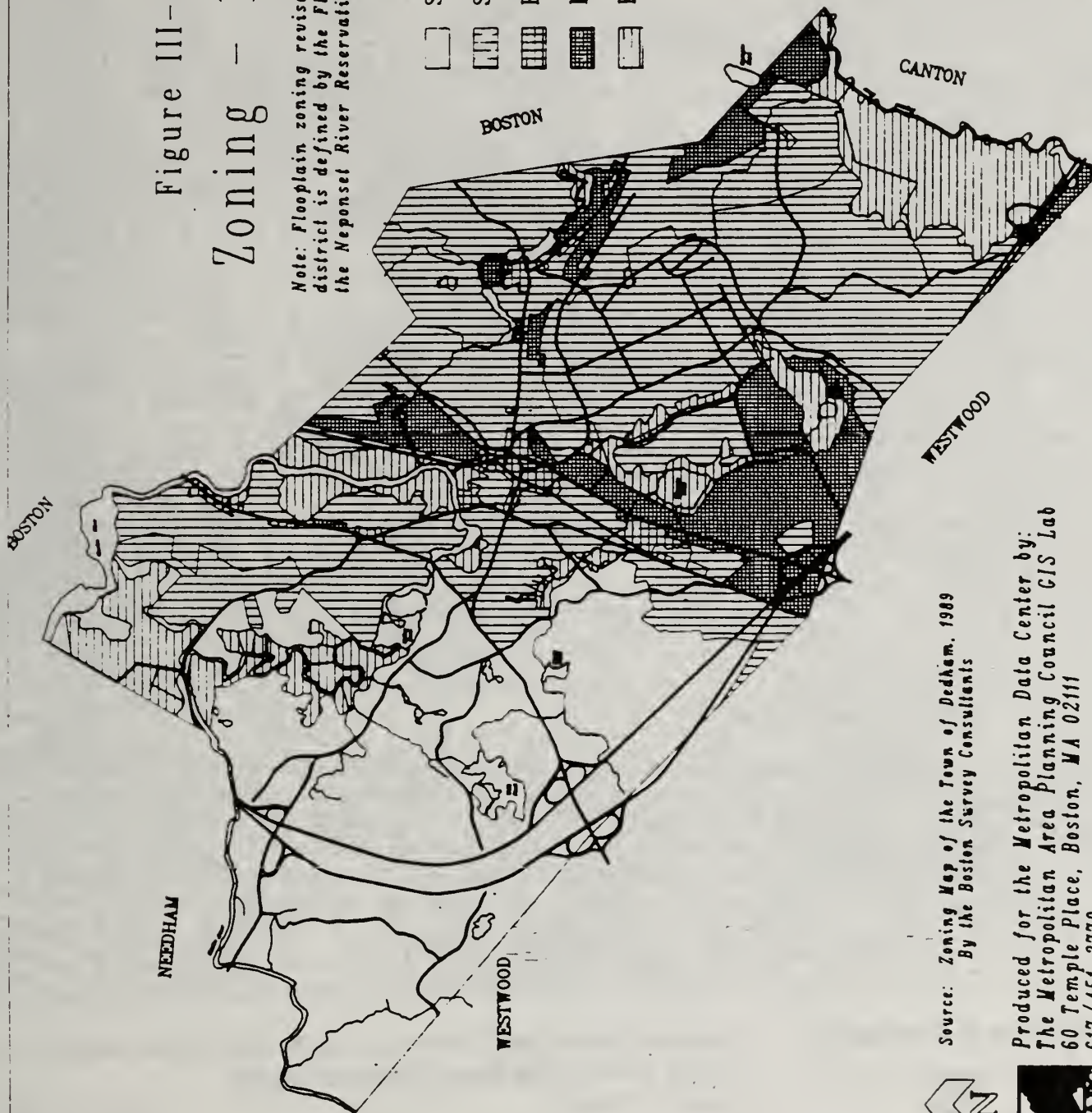
b) Recent Growth: Proposed Subdivisions and Building Permits

According to the Building Commissioner, 300 dwelling units were built in Dedham between January 1, 1980 and December 31, 1989. Table III-C shows that residential construction peaked in 1985 and 1986.

Figure III-G Zoning - 1989

Note: Floodplain zoning revised in 1991. The new floodplain district is defined by the Flood Insurance Rate Map plus the Neponset River Reservation.

-  Single Residence (A)
-  Single Residence (B,G)
-  Business (AP, LB, GB)
-  Manufacturing (LM, LMB)
-  Floodplain zoning 1989 (FP)



Source: Zoning Map of the Town of Dedham, 1989
By the Boston Survey Consultants

Produced for the Metropolitan Data Center by:
The Metropolitan Area Planning Council GIS Lab
60 Temple Place, Boston, MA 02111
617/451-2770



Figure III - H



Weston & Sampson

ENGINEERS, INC.



Five Centennial Drive, Peabody, MA 01960-7906

Aquifer Protection District of the Bridge Street Well Field in the Town of Dedham, Massachusetts

Scale: 1 : 25,000

March 26, 1990



Weston & Sampson

TABLE III-C
RESIDENTIAL BUILDING PERMITS

YEAR	RESIDENTIAL BUILDING PERMITS
1980	24
1981	38
1982	29
1983	36
1984	32
1985	44
1986	44
1987	28
1988	10
1989	15

Information on building permits for commercial development was not available prior to 1987. The total dollar value of commercial construction can be used instead as a measure of development activity.

TABLE III-D
COMMERCIAL CONSTRUCTION

YEAR	VALUE OF COMMERCIAL CONSTRUCTION
1980	\$ 1.1 million
1981	\$ 3.6 million
1982	\$ 3.6 million
1983	\$ 6.6 million
1984	\$ 6.2 million
1985	\$ 13.0 million
1986	\$ 9.6 million
1987	20 permits
1988	7 permits
1989	7 permits

The Metropolitan Area Planning Council maintains a development file, listing residential, commercial and office developments throughout the region. Tables III-E and III-F show this information for the Town of Dedham. The major office developments are the Dedham Corporate Center, 55 Allied Drive and Rosenfeld Concrete. There are several one and two-family residential developments approved and expected to be completed in the next two years.

c) Expansions to Infrastructure

Sewer Projects - The Massachusetts Water Resources Authority is currently undertaking the Wellesley Extension Sewer Replacement Project in Needham, Wellesley, Framingham, Natick and a portion of Dedham. The project involves replacing a 60 inch pipe, and primarily affects the Riverdale section of Dedham. The pipe comes into Dedham from Needham, crosses the Charles River twice, and intersects Needham Street, Vine Rock Street, and Bridge Street. Because this is a sewer replacement project, it does not open new areas to development.

Road Projects - There are two major federally-funded highway projects listed in the Proposed Amendments to the Transportation Improvement Program 1990-1994 prepared by the Boston Metropolitan Planning Organization. These are the bridge reconstruction on Route 1/128 and Spring Street over the Charles River. There are also several state-funded highway projects planned for Dedham. The bridge at Mt. Vernon Street will be removed and the right-of-way filled in. Additional bridges to be reconstructed are the bridge on Route 128 over Route 135, Route 128/I-95 southbound over the Charles River and Route 1A/Washington Street over Route 128. The only project for which funding is certain is the bridge reconstruction on Route 1/128.

d) Build-Out

In the 1989 Town Report, the Planning Board report indicated that as of 1980, there were over 2,100 acres of undeveloped land left. The Planning Board also noted that there is a significant potential for residential and industrial development on under-utilized parcels. The town is in the process of considering the preparation of a master plan which will include an analysis of the development potential of undeveloped land.

METROPOLITAN AREA PLANNING COUNCIL DEVELOPMENT FILE*

SUMMARY OF RESIDENTIAL DEVELOPMENT
TABLE III-E

#	PROJECT TITLE	ADDRESS	TYPE	UNITS	AFFORDABLE		
					STATUS	COMPLETION HOUSING (19--1) YES UNITS	COMPONENT FUNDING
5	Rosen Acres	off Greenlodge St.	S-Fam.	20	App.	88	completed
6	Margaret Road	Margaret Road	S-Fam.	5	App.	88	completed
9	W. Clerkin	383 Westfield St.	S-Fam.	38	Pending	95	preliminary
10	Stephen Lane	Stephen Lane	S-Fam.	5	App.	89	completed
11	Cocci Way	Cocci Way	2-Fam.	4	App.	90	completed
12	Greenlodge Place	Greenlodge Place	S-Fam.	5	App.	88	completed
13	Mancuso Way	Mancuso Way	2-Fam.	4	App.	91	
14	Davis Way	off Sandy Valley Rd.	S-Fam.	2	App.	91	
15	Erin Way	off Sandy Valley Rd.	S-Fam.	4	App.	?	

*SOURCES: This development information has been collected from various community officials by MAPC since 1986. Additional sources are environmental notification forms, environmental impact reports, and local newspapers.

This information was last updated in FEBRUARY 1990.

METROPOLITAN AREA PLANNING COUNCIL DEVELOPMENT FILE*

SUMMARY OF INDUSTRIAL AND COMMERCIAL DEVELOPMENT
TABLE III-F

#	PROJECT TITLE	ADDRESS	TYPE	SIZE	STATUS	PROJECTED COMPLETION (19--1)
10	Dedham Corporate Center	Allied Dr/Rustcraft	Office	175,000	Pending	95
11	Dedham Corporate Center 2	" " "	"	945,000	Pending	99
12	Dedham Corporate Center Capone	Off Stergis Way	"	2.6 acres	Approved	?
13	Rosenfeld Concrete Corp.	" " "	"	12.9 acres	Approved	?
14	55 Allied Drive	Allied Drive	"	2.73 acres	Pending	

*SOURCES: This development information has been collected from various community officials by MAPC since 1986. Additional sources are environmental notification forms, environmental impact reports, and local newspapers.

This information was last updated in FEBRUARY 1990.

SECTION IV - ENVIRONMENTAL INVENTORY AND ANALYSIS

A. GEOLOGY, SOILS AND TOPOGRAPHY

1) Geology - Information on the geology of Dedham was obtained from the U.S. Geological Survey. Dedham is situated on two U.S.G.S. quadrangle maps; the Boston South Quad (formerly the Newton Quad) and the Norwood Quad (formerly the Norfolk Quad). The geology of the Boston South Quad has not yet been mapped. Therefore, this discussion is based on the Norwood Quad and assumes that the geology of the two areas is similar.

Dedham is located in the Seaboard Lowland physiographic region of New England. This region is characterized by low to moderate relief. The diverse topography results from the irregular configuration of bedrock and partly by the effects of glaciation.

Bedrock Geology - The bedrock consists mostly of igneous and sedimentary rocks. The major rock types are Dedham Granodiorite, Westwood Granite, and Mattapan Volcanic Complex. There are also small areas of Roxbury Conglomerate. There are bedrock outcrops in the vicinity of Greenlodge, Ashcroft and East Dedham. In the vicinity of Routes 128 and 109, there is an area of granite with a distinctive pink color. During the late 19th century, this pink granite was removed from three small quarries which are no longer active. The stone from these quarries was used for several Dedham buildings including St. Paul's Episcopal Church, Memorial Hall, St. Mary's Church, the public library and the Bullard residence. It was also used in Trinity Church in Boston.

Surficial Geology - The geology of Dedham is the result of glaciation. The outwash plains (broad gently sloping plains of horizontally stratified sand and gravel deposited by glacial melt waters) have been utilized for residential and commercial development. Most of the town is underlain by ground moraine. There are many sand and gravel deposits, mostly found in kame terraces. Kames are small hills of varied sizes and shapes composed of sand and gravel. These sand and gravel deposits are found east of Wigwam Pond, in Ashcroft and south of Greenlodge.

2) Soils - An understanding of the distribution of the various types of soils can be very important in the planning and development of a site for a specific purpose. Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are unstable and not suitable to be used for buildings or roads. Clay or wet soils are poorly suited for use as septic tank absorption fields. A high water table can cause problems in the construction of basements and underground installations. The patchwork pattern of the undisturbed soils in Dedham was produced by glacial action, but large areas of the town show the effects of

development and road building. The wide range of soil types extends from the Hollis-Rock Outcrop-Charlton complex which can be seen as the uppermost layers exposed by the excavations along much of Route 128 to the Freetown Muck surrounding Wigwam Pond and the Saco Silt Loam common along both the Charles and Neponset Rivers. The Fowl Meadow Wetland which includes Dedham's principal aquifers is made up of many different soil types with large areas of Canton Fine Sandy Loam and Swansea Muck.

Because of the great variety of soils in the area and the important differences in their properties, specific site evaluations may be necessary when soil characteristics are critical, such as in the design of septic systems or retention basins.

The soils map (Figure IV-A) shows all the soils in Dedham grouped into three general categories according to the degree of limitation for development.

3) Topography - The gently rolling terrain of Dedham ranges generally from 100 to 200 feet above sea level. A few areas in the southern part of town are somewhat lower as they approach the Neponset River Reservation and stretches of East Dedham along Mother Brook are less than 100 feet in elevation. Wilson Mountain to the north is almost 300 feet high. Overgrown stone walls still standing in densely wooded areas suggest the ways early settlers made use of the topographical variations for level farmlands and hilly grazing areas.

B. LANDSCAPE CHARACTER

Mother Brook and East Brook meander between the Charles and the Neponset rivers. In the western part of town, Wilson Mountain is a dominant landscape feature. The western portion of the town has been designated a noteworthy landscape by the Department of Environmental Management.

C. WATER RESOURCES

1) Surface Water

Dedham's history and development have evolved around its waterways. Both the Charles and Neponset Rivers have provided a means of easy transportation and a source of power for mills and factories.

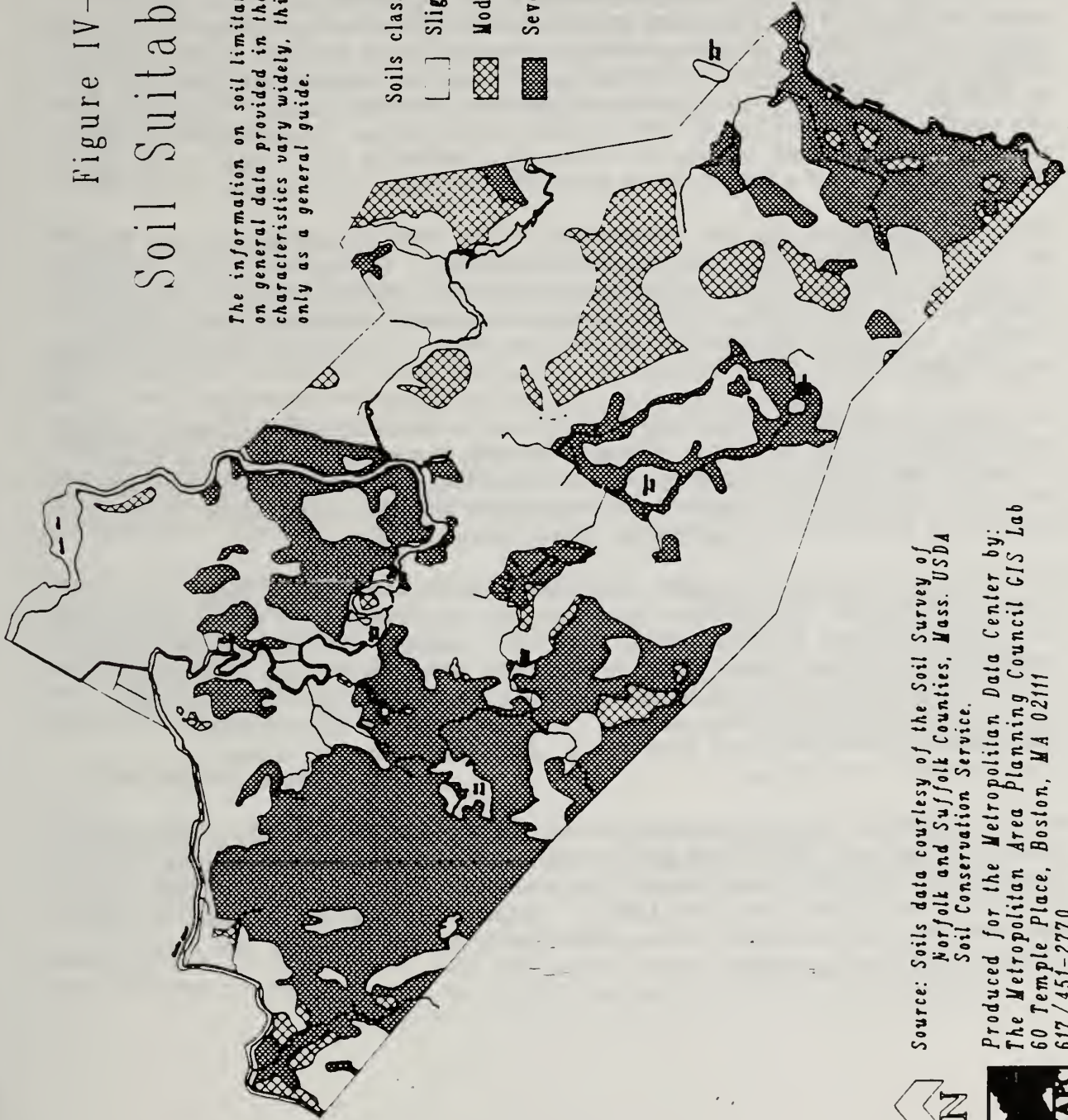
Mother Brook, the first canal constructed by the colonists in America, was dug in 1641 to connect the two rivers. Its well-channelled flow turned the wheels of mills which ground corn and which manufactured such products as cotton and woolen fabrics, paper, nails and carpets. The mills are gone now but Mother Brook still plays an important part in the life of the town.

Figure IV-A Soil Suitability

The information on soil limitations for development is based on general data provided in the Soil Survey. Because soil characteristics vary widely, this information should be used only as a general guide.

Soils classed by impact on development

- Slight limitation to development
- ▨ Moderate limitation to development
- Severe limitation to development



Source: Soils data courtesy of the Soil Survey of
Norfolk and Suffolk Counties, Mass. USDA
Soil Conservation Service.

Produced for the Metropolitan Data Center by:
The Metropolitan Area Planning Council GIS Lab
60 Temple Place, Boston, MA 02111
617/451-2770

The diversion of up to one third of the flow of the Charles River to the Neponset is controlled by a bascule dam located at the confluence of the Charles and the Brook. This diversion is a vital flood protection measure.

The Charles River marks the boundary between Dedham and Needham and then flows south and meanders through the northern section of the town. It then reverses itself and, forming a loop, flows north to serve as the boundary with the West Roxbury section of Boston.

The Charles is one of the most important rivers in eastern Massachusetts. Its total drainage area is approximately 307 square miles. The river rises in the Town of Hopkinton approximately 25 miles southwest of Boston, and flows, through a highly circuitous course, in a generally northeast direction through extensive wetlands, of which a considerable portion is in Dedham. The river is about 80 miles long, falling some 350 feet from its source to its outlet at the Charles River basin. The portion of the river flowing through Dedham is extremely flat with many areas of natural storage which play a significant role during times of flooding.

The Neponset River has its headwaters in the Town of Foxborough and flows in a northeasterly direction to Dorchester Bay. The river, as it passes through Dedham, is characterized by extensive swamplands and is extremely sluggish. It forms the eastern boundary between Dedham and the town of Canton. Almost the entire length of the river in Dedham is located within the Neponset River Reservation.

The Dedham segment of the Charles River has a water quality classification of "B" which means that the waters must meet standards which make them fishable (warm water fisheries) and swimmable. Currently, this portion of the river only partially meets these standards. The major water quality problem is color due to suspended vegetable particles.

The Dedham portion of the Neponset River has the same water quality classification as the Charles. It does not, however, meet those standards as well, the major problems being nutrients and low dissolved oxygen from combined sewer overflows. The town's many ponds and brooks connect an intricate pattern of marshes and swamps which are linked to the large wetland systems of the two rivers. The pressures of growth and development throughout the town are a constant threat to these irreplaceable resources.

As the number of choice building sites decreases, areas which include or border on wetlands and flood plains are now being considered for use as house lots. The floods of August, 1955; March, 1968 and March, 1969 would have occurred anyway, but the loss of so much flood storage capacity which had been provided by these areas undoubtedly contributed to the extensive damage the floods caused.

2) Flood Hazard Areas

Under the earlier zoning , The Dedham Floodplain Zoning By-Law defined a floodplain by elevations in specified sections of the town. Filling or building in these areas is prohibited in order to preserve the flood-mitigating effects of these vital resources. A new zoning bylaw was recently enacted which defines floodplain districts as the areas shown as A, A1-A30 on the federal Flood Insurance Rate Map (FIRM) and the Neponset River Reservation. The FIRM map is shown in Appendix F.

The Dedham floodplains and the 100 Year Flood Line as determined by the Federal Emergency Management Agency (FEMA) are both measured by elevation in feet but they are not calculated from the same base level. The 100 Year Flood Line is measured by the commonly used National Geodetic Vertical Datum (NGVD). The Town of Dedham uses the same base as does the City of Boston which is 5.64 feet lower than NGVD. This difference must be accounted for when comparing elevations on maps or plans based on different systems.

3) Wetlands

Belatedly, an awareness of the importance of the wetlands emerged. They serve not just as a sponge to soak up inundations, but also as a protection for groundwater, for the prevention of aquifer pollution and as a habitat for wildlife. There now are effective laws to support Conservation Commissions in their efforts to control the problem. The Massachusetts Inland Wetlands Protection Act provides the basic authority and a new comprehensive Dedham By-Law adds further protection. As authorized by the Massachusetts Inland Wetlands Restriction Act the major wetlands in Dedham have been mapped and numbered and are provided with special protection which prohibits encroachment or development of any kind. Maps of the wetlands restrictions are included in Appendix E and are generally shown on Figure IV-B, Water Resources.

No single map defines all of the wetland and floodplain areas of the Town. The 100-year floodline is shown on the "FEMA" map. "Restricted" wetlands are delineated on maps authorized by state law. Town floodplain has been amended to the FEMA map standard. Additionally, there are many small wetlands and floodplains which are not recorded anywhere, being subject to site-by-site determinations by the Conservation Commission.

4) Aquifer Recharge Areas

Dedham's most important water resource is not even visible! The town depends for its drinking water on wells and, because this vital asset is so vulnerable and so commonly misunderstood, a very brief review of some of its characteristics may be useful.

Precipitation in the form of rain and melted snow enters the ground and gradually percolates downward to a point where all of the pores between


rock and soil particles are completely saturated. This zone of saturation is the source of groundwater. The top of this zone is called the Water Table. The Water Table is not level like the surface of a pond and while groundwater does flow, its lateral movement is very slow. The direction of its flow is affected by complex factors other than gravity and is therefore not always predictable. The mixture of porous rock fragments and soil particles which is essential for the storage of groundwater is the debris which was deposited by the melting glacier more than 10,000 years ago.


An aquifer is a groundwater supply which is capable of yielding a significant volume of water for a useful well. Aquifers of sufficient capacity to serve as a municipal water supply are scarce and are found only in locations with certain geologic and hydrologic conditions. Most aquifers with such a volume were formed in valleys carved into bedrock millions of years ago by ancient rivers that drained the continent.

Figure IV--B

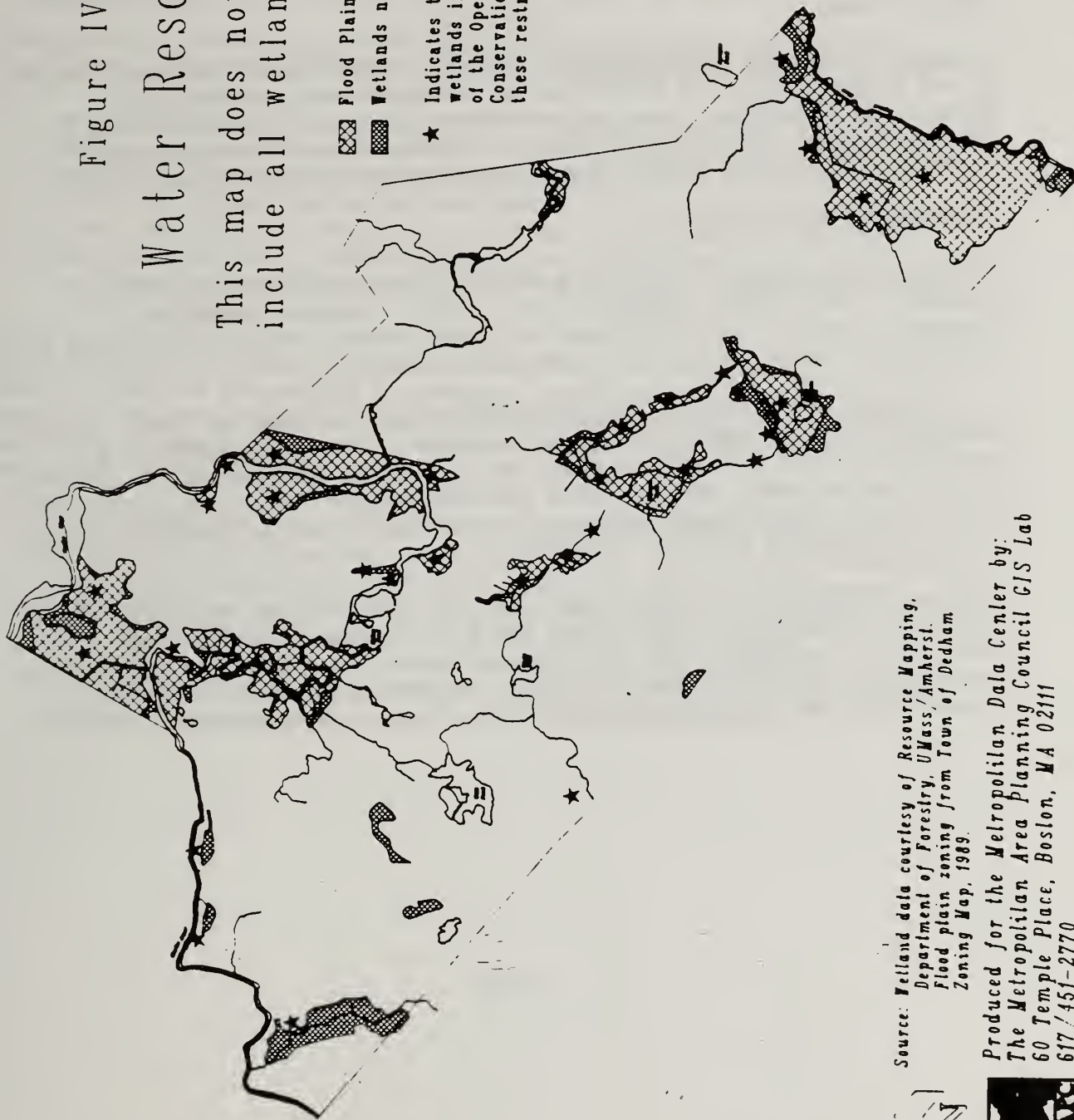
Water Resources

This map does not necessarily include all wetland areas.

 Flood Plain zoning (1989)

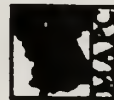
 Wetlands not zoned as Flood Plain

★ Indicates that there is a restricted wetlands in the vicinity. See Appendix E of the Open Space Plan or the Town Conservation Agent for maps of these restrictions.



Source: Wetland data courtesy of Resource Mapping,
 Department of Forestry, UMass/Amherst.
 Flood plain zoning from Town of Dedham
 Zoning Map, 1989.

Produced for the Metropolitan Data Center by:
 The Metropolitan Area Planning Council GIS Lab
 60 Temple Place, Boston, MA 02111
 617/451-2770



D. VEGETATION

1) Forest Land - According to the 1985 land use data, there were 1,776 acres of forest in Dedham. The forested land includes large areas such as the town forest and Wilson Mountain as well as many smaller areas scattered throughout the town. Most of the forested land is west of Route 1 in the vicinity of Route 128. In the eastern part of town, most of the forest land is adjacent to the Neponset River or surrounding Wigwam Pond.

2) General Inventory - Dedham's vegetation is typical of the rest of eastern Massachusetts. In the moderately to well-drained upland areas the predominant species are oak, maple, hickory, grey birch, beech, poplar, white pine, hemlock. White birch, ground juniper, cedar and spruce can also be found.

3) Rare, Threatened and Endangered Species - The Natural Heritage Program of the state Division of Fisheries and Wildlife was contacted for information concerning rare and endangered species (See Appendix A). Observations of several endangered and threatened species have been recorded but the most recent observations date from approximately 1902.

E. FISHERIES AND WILDLIFE

1) General Inventory - Amphibians and reptiles are commonly found. Raccoons, fox, skunks, opossums, rats, gulls, pigeons, muskrats, pheasants, rabbits and woodchucks are also common. White-tailed deer are occasionally found in the rural-suburban fringe.

2) Corridors - The major wildlife corridors are the Charles River and the Neponset River and their associated wetlands. The large forested area east of Route 128 may also function as a wildlife area but Route 128 cuts it off from adjacent forests, thus diminishing its utility as a corridor. Much of the remaining wetlands and forests are in small, scattered parcels which are not good wildlife habitats.

3) Rare, Threatened and Endangered Species - The Natural Heritage Program of the state Division of Fisheries and Wildlife was contacted for information concerning rare and endangered species (See Appendix A). Observations of several endangered and threatened species have been recorded but the most recent observations date from approximately 1902.

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

1) Scenic Landscapes

The Massachusetts Landscape Inventory - In 1982 the Department of Environmental Management published a report entitled "Massachusetts Landscape Inventory - A Survey of the Commonwealth's Scenic Areas". The purpose of this study was to devise a system for classifying landscapes that were worthy of protection and to apply it throughout the Commonwealth. The system identified areas as being distinctive, noteworthy or common. A portion of Dedham was identified as being a "noteworthy" scenic landscape. This area is shown on Figure IV-C, Special Landscape Features .

Dedham was included in an area identified as the Upper Charles River Unit. This area was described in the 1982 report as follows:

This unit follows the course of the Charles River from West Street in Dedham to Noon Hill in Medfield. It includes the Lake Waban area in Wellesley, Pegan Hill in Dover and some extensive wetlands in Medfield. These reaches of the Charles are relatively unpolluted and quiet, making it an excellent canoeing river close to the Boston Metropolitan area. Pegan Hill in Dover offers some fine vistas to the north and west. This area is built up, though in many cases with larger holdings.

Scenic Roads - The Scenic Roads Act (G.L. Ch. 40, Section 15C) affords a certain level of protection to roadside trees and stone walls on local roads which have officially been designated as scenic roads. There are currently no designated scenic roads in Dedham. The text of the Scenic Roads Act is as follows:

Upon recommendation or request of the planning board, conservation commission, or historical commission of any city or town, such city or town may designate any road in said city or town, other than a numbered route or state highway, as a scenic road. After a road has been designated as a scenic road any repair, maintenance, reconstruction, or paving work done with respect thereto, shall not involve or include the cutting or removal of trees, or the tearing down or destruction of stone walls, or portions thereof,

except with the prior written consent of the planning board, or if there is no planning board, the selectmen of a town, or the city council of a city, after a public hearing duly advertised twice in a newspaper of general circulation.....Designation of a road as a scenic road shall not affect the eligibility of a city or town to receive construction or reconstruction aid for such road pursuant to the provisions of chapter ninety.

Stone walls and tree-lined streets are part of what is commonly considered "town character". The scenic roads act is one tool which the town can use to preserve town character.

2) Major Characteristics or Unusual Geologic Features

Although Dedham has been affected by glaciation, there are no particularly unusual glacial features.

3) Cultural and Historic Areas

Dedham has a rich history and there are many cultural and historic areas which have been preserved.

a) Fairbanks House - This house is located at East Street and Eastern Avenue. It is the oldest house in Dedham (circa 1636) and has been recognized by the Department of the Interior as the oldest frame house in the United States. The property is owned by The Fairbanks Family Association and is open to the public. It is listed on the National Register of Historic Places.

b) Historic Districts - There are two local historic districts which were designated according to Massachusetts General Laws, Chapter 40C. The Connecticut Corner Historic District is located on High Street from Lowder Street to the far point of Dedham Common. It was designated in 1975. The Franklin Square-Court Street Historic District is composed of parts of High and Court Streets, River Place, and Village Avenue, plus all of Church, School, Norfolk Streets and Franklin Square. It was also designated in 1975. Historic districts and buildings are shown on Figure IV-C: Special Landscape Features.

c) Endicott Estate - The Endicott Estate was built in 1904 by Henry Endicott, founder of the Endicott Johnson Shoe Company. In 1955, Henry's daughter Katherine bequeathed the estate to the town. After her death in 1967, the town took over the mansion. It is now used for functions and for passive recreation.

d) Town Common - The town common is located at Bridge, High and Common Streets.

e) County Buildings - The old Norfolk County Jail is proposed to be phased out when the new prison on Route 128 is completed. The town would like to see the county turn the property back to the town. The Norfolk County Courthouse is another significant county building.

f) Powder House - This hip-roofed brick structure, located off Pleasant and Ames Streets, was built in 1766.

g) Court House - The second Norfolk County Courthouse was built in 1827. It was enlarged in 1862 by the addition of flanking wings at one end and a high dome. A second set of flanking wings was added in 1892. It is listed on the National Register of Historic Places.

h) Community House - This structure serves as a community center. There is a playground and a day care center. The building can be rented out for functions. It is located on the Charles River. There are recreational programs and classes.

i) National Register Properties - In Dedham, there are three buildings listed on the National Register of Historic Properties. These are the Ames Schoolhouse on Washington Street, the Fairbanks House and the Norfolk County Courthouse on High Street.


4) Areas of Critical Environmental Concern - There are no state-designated Areas of Critical Environmental Concern in Dedham.


Figure IV--C Special Features Map

The information on soil limitations for development is based on general data provided in the Soil Survey. Because soil characteristics vary widely, this information should be used only as a general guide.

Soils classed by impact on development

SL - Slight limitation
MO - Moderate limitation
SE - Severe limitation

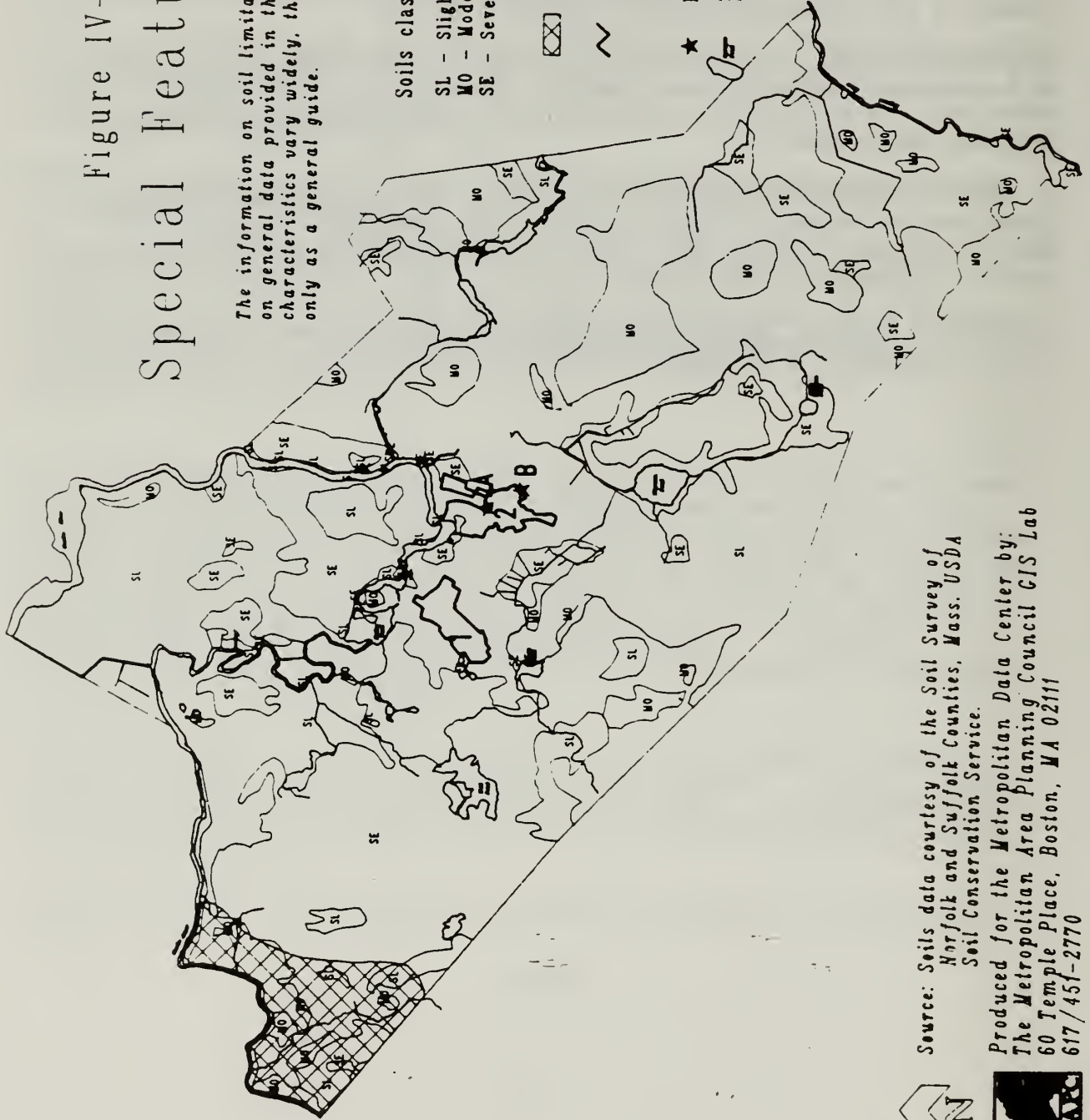
 DEM Scenic Landscape

 Historic districts

1 - Connecticut Corner H.D.
2 - Franklin Square - Court Street H.D.

★ Historic sites

A - Norfolk County Court House
B - Ames Schoolhouse



Source: Soils data courtesy of the Soil Survey of
Norfolk and Suffolk Counties, Mass. USDA
Soil Conservation Service.

Produced for the Metropolitan Data Center by:
The Metropolitan Area Planning Council GIS Lab
60 Temple Place, Boston, MA 02111
617/451-2770



G. ENVIRONMENTAL PROBLEMS

- 1) Hazardous Waste Sites - According to the Department of Environmental Protection (DEP), Division of Hazardous Wastes, there are fourteen potential hazardous waste sites in Dedham. These are classified as "Locations to be Investigated" which are locations which DEP considers reasonably likely to be disposal sites but are as yet unconfirmed. These are primarily industrial sites and gas stations. Another five sites have been identified as "Confirmed" sites and these were all fuel oil spills. An additional two sites are on the "Remedial" list which means that remedial action has been completed.
- 2) Landfills - The former municipal landfill off of Washington Street to the rear of the Dedham Mall, was closed in 1976.
- 3) Erosion - Erosion is not a major problem in Dedham and is generally associated with construction activities. The Conservation Commission monitors construction projects when wetlands are involved and ensures that appropriate mitigation measures are followed.
- 4) Chronic flooding - A flood insurance study was prepared in 1978 by the U.S. Department of Housing and Urban Development, Federal Insurance Administration, as part of the National Flood Insurance Program. This report states that there have been five major floods since the turn of the century. The most damaging flood was in 1955. After that flood, extensive flood control improvements were implemented on both the Charles and Neponset rivers, including the use of wetlands restrictions and the Army Corps of Engineers Natural Valley Storage Program.

The most recent flood was in 1968. The major areas affected were Bridge Street, Maynard Road, Readville Manor, the rear of Dedham Plaza between Routes 1 and 1A, Robert and Booth Roads. The "Manor" district of Dedham and the Charles River at Claybank Road are two additional areas where flooding has been a problem.
- 5) Sedimentation - Sedimentation sometimes occurs as a result of construction activities. The Conservation Commission monitors construction activities and may require silt fences and hay bales where appropriate. Sedimentation has been a problem with the MWRA sewer replacement project due to the extensive excavation required for this project. Water accumulates within the areas of excavation and is pumped out. Some silt settles out but some is pumped out with the water and discharged to the Charles River. The Conservation Commission and the MWRA have been working cooperatively to ensure that sedimentation is minimal.

6) Development Impact - Most new development has some impact on the environment although many of these impacts can be minimized by strict enforcement of federal, state and local environmental regulations. The major impacts are an increase in paved areas which can contribute to flooding, erosion and sedimentation during construction, pollution potential from industrial processes, loss of open space and wetlands.

7) Ground and surface water pollution - Although there has been no specific problem identified, the use of road salt throughout the town and particularly near the wells at Bridge Street, poses a potential threat to water quality. Water treatment plant construction has been necessary for elimination of iron and manganese from the Bridge Street wells, and for elimination of industrial contaminants (1,1,1 trichlorethane) from other wells.

SECTION V - INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

A. INTRODUCTION

The open space and recreation resources in the Town of Dedham encompass a variety of types of land and water sites, as well as cultural and historic resources, both publicly and privately owned. The purpose of this inventory is to make the reader aware of the open spaces that exist in the town and to provide a baseline against which to evaluate existing and future needs. Table V-A is a complete listing of all lands of conservation and recreation interest. Figure V-A graphically shows the distribution of protected and un-protected open lands.

For the purposes of open space planning, it is important to be aware of the degree of protection of each parcel. This helps to identify those areas where preservation or acquisition efforts should be targeted. The following categories are a useful way to look at the degree of protection.

Highly Protected Conservation and Recreation Land - This includes all land that is held in fee simple ownership by a municipal, state or federal agency or non-profit conservation organization. These lands are owned and managed specifically for the purpose of conservation and/or recreation. The Massachusetts Constitution (Article 97) and M.G.L. Chapter 40 make it difficult for a municipality to sell or transfer conservation land or to use it for a different municipal purpose.

Restricted Open Land - This category consists primarily of privately-owned land from which development is restricted through a conservation restriction in perpetuity or an agricultural preservation restriction. See Chapter X for a description of these techniques.

Moderately Restricted Open Land - This includes land that is taxed as forest, farm, or recreation land under Chapter 61, 61A or 61B or land on which development is restricted through a short-term (5-30 years) conservation restriction. These tax programs are often used to lower taxes until such time as development or sale is economically feasible or desired and are seldom used on a long-term basis. These lands are quite vulnerable to development. See Chapter X for a description of these programs.

Unprotected Land - This includes all undeveloped land that has not been developed for residential, commercial or industrial development, or transportation-related uses. This includes open land associated with major institutions (public or private) where the open space use is secondary to a non-conservation use. Examples include schools, colleges, cemeteries, hospitals, and military installations. It also includes

commercial recreational facilities such as golf courses. These lands are often perceived as being a secure part of the open space network of a community because of the length of time they have existed as such but most often they are not protected from potential development.

B. PRIVATE PARCELS

There are approximately 1,451.78 acres of privately owned land of recreation or conservation interest. Most of this land is not currently protected or restricted although it appears as open space.

- 1) Agricultural lands under Chapter 61 A - There are no lands enrolled under Chapter 61A and little potential for use of this program.
- 2) Forest Land including Chapter 61 - There are 55 acres of private forest land.
- 3) Less than fee interests - There are no Agricultural Preservation Restrictions. The Trustees of Reservations hold a perpetual conservation restriction on five lots totalling 139 acres along the Charles River near the Westwood border. The land is known as the Sears property. The restriction prohibits further residential development. The Army Corps of Engineers holds easements on many acres of wetlands along the Charles River.
- 4) Private recreation lands: Chapter 61B - There are no lands enrolled in Chapter 61B.
- 5) Estates - There are 22 large estates (over five acres) totalling 684.68 acres. These are all zoned Single Residence A and are all in the western part of the town. This does not include the Sears property which is protected under a conservation restriction. Single Residence A zoning allows homes on lots of 40,000 square feet. Without taking into account parcel boundaries, lot geometry and other site specific factors, this land area could accommodate roughly 650 new homes if built out. These large estates are very vulnerable to development as land values increase. Several of these estates are in an area designated by the Department of Environmental Management as a scenic landscape and further development on these parcels would conflict with the goal of preserving the scenic character.
- 6) Agriculture - There were approximately 70 acres of agricultural land in Dedham according to the 1985 land use data. This agricultural land is generally in small parcels and all of it is west of Route 1.

7) Major institutional holdings - There are a total of 387.1 acres of private institutional holdings.

Ursuline Academy	27.6
Dedham Country and Polo Club	98.7
MIT Endicott House (Haven St.)	25.0
Noble and Greenough School	115.0
Northeastern University on Route 135	20.2
SMA Fathers African Mission on Route 135	21.1
American Legion	4.1
Dedham Community Association	8.8
St. Susanna's	7.0
Fairbanks House	3.2
Private cemeteries	25.4
Animal Rescue League	19.3
Dedham Country Day School	11.7

Many of these lands are also vulnerable to development. Institutions frequently find that they must sell off some of their excess land in order to have enough money to continue to exist. Development of these institutional lands can significantly change the character of the town.

8) Other private lands

a) The Island - This is a privately-owned parcel across from the Dedham Mall. It is a wooded parcel surrounded by wetlands. There is no access to the parcel currently; a causeway would be required.

b) Wilson Mountain - This parcel is adjacent to Northeastern University. It is approximately 92 acres. The property is on the MDC acquisitions list. There is a long dirt road leading to the site. The parcel is wooded, steep and has many boulders. There is a good view of Boston from the top of the site. There are hiking trails on the property which are currently being used.

c) Border Meadows - This parcel is approximately 24 acres and is located on the Charles River at Dedham Street towards the southern end of Cutler Park. The parcel is also on the MDC future acquisitions list. The parcel is primarily wetlands. It is likely that the MDC would purchase less than the full 24 acres.

Note: The Open Space Committee cannot identify this parcel, and believes the MDC may be referring to property in Needham.

C. PUBLIC AND NON-PROFIT PARCELS

1) There are 1,158.75 acres of public and non-profit recreation and conservation land in Dedham. This represents 16.9% of the total acreage of the town. It is likely that the status of these lands will remain unchanged. If any schools are closed in the future and sold or leased, the recreational facilities should be protected.

TOWN OF DEDHAM

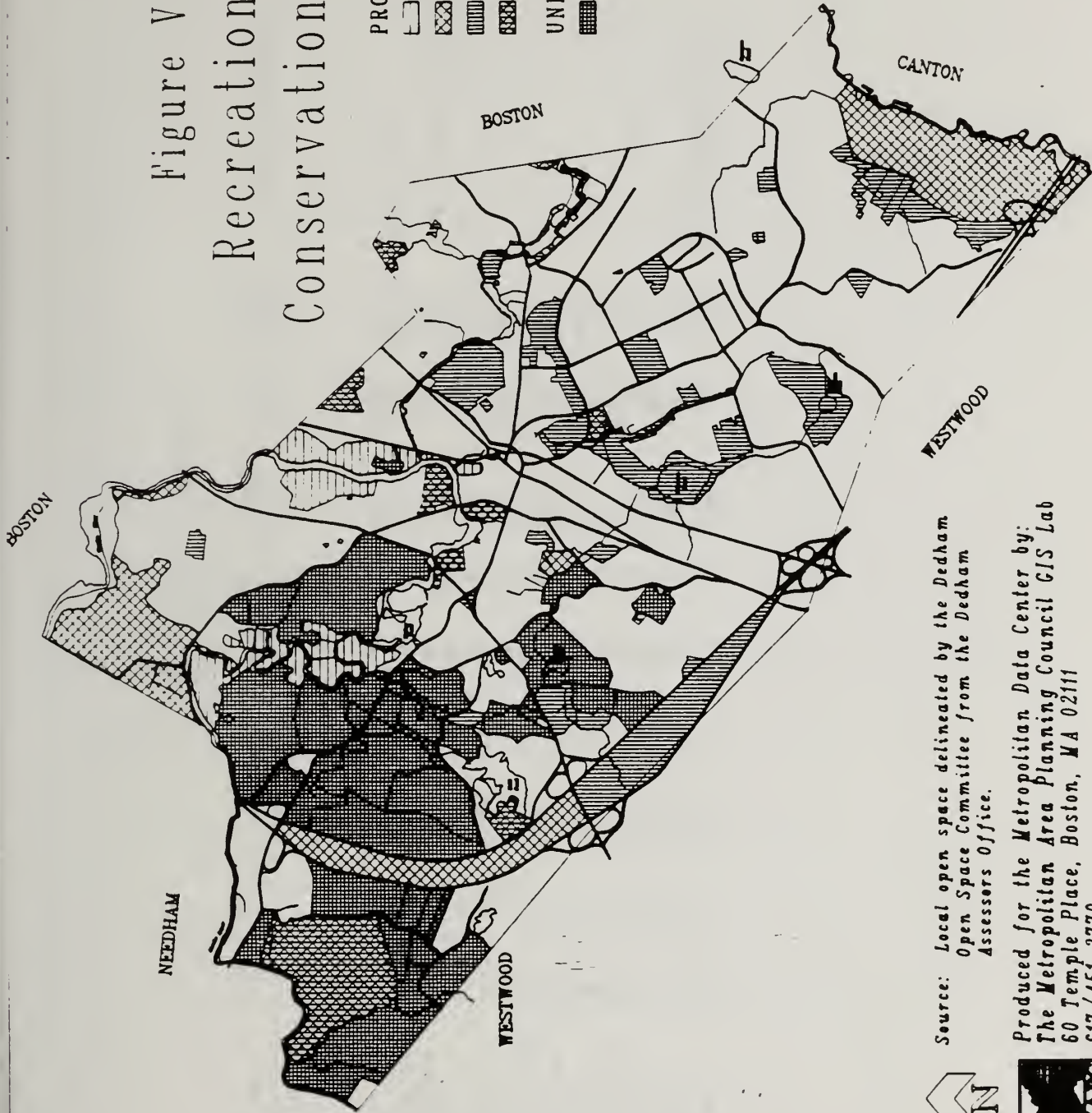
Conservation	155.74
Conservation or Recreation	21.50
Schools	104.04
Town Dump (closed)	7.68
Parks/Recreation	40.24
Town Forest	76.48
Cemeteries	46.95
Endicott Estate	18.23
Miscellaneous	10.65
NORFOLK COUNTY	6.70
ARMY CORPS OF ENGINEERS NATURAL VALLEY STORAGE PROGRAM	223.90
METROPOLITAN DISTRICT COMMISSION	402.60
DEDHAM HISTORICAL SOCIETY BIRD SANCTUARY	18.50
DEDHAM-WESTWOOD WATER DISTRICT	13.33

2) Semi-Public Lands

The Massachusetts Audubon Society owns 12.21 acres of land with 1/4 mile of frontage on Route 128. The property is primarily an oak forest and maple swamp adjacent to Weld Pond and is not open to the public.

Figure V-A Recreation and Conservation Lands

- PROTECTED LAND**
- Army Corps of Engineers
 - State/County Government
 - Town Government
 - Protected Private
- UNPROTECTED LAND**
- Unprotected Private



Source: Local open space delineated by the Dedham
Open Space Committee from the Dedham
Assessors Office.

Produced for the Metropolitan Data Center by:
The Metropolitan Area Planning Council GIS Lab
60 Temple Place, Boston, MA 02111
617/451-2770



D. SUMMARY AND ANALYSIS OF INVENTORY

Years of effort by the Conservation Commission, Parks Department and other town boards and local groups have resulted in the protection of many valuable open space areas. Many of the major wetland systems have been protected and there is an active parks and recreation program. The major remaining needs for open space protection appear to be the need for more neighborhood and community parks for daily recreation needs and the need to consider the impacts of future potential development of private estates and major institutions.

DEDHAM OPEN SPACE PLAN INVENTORY
TABLE V-A

PARCEL NAME	OWNER	MANAGE	FUNDS	ACRES	CONDITION	REC.	PUBLIC	ZONING	DEG. OF	DESCRIPTION/COMMENTS
	SHIP	MENT	USED			POT.	ACCESS		PROTECT.	
A. PRIVATE PARCELS										
Sears Property	Priv.	TIOR	None	139	NA	NA	None	SRA	CR	Tennis courts.
Dedham Tennis Club	Priv.	Priv.	None	1	NA	NA	Fee	SRA	None	
Dedham Country Club	Priv.	Priv.	None	98.7	NA	NA	None	SRA	None	
23 estate > 5 acres	Priv.	Priv.	None	823	NA	NA	None	SRA	None	Large residential properties.
African Fathers	Priv.	Priv.	None	21.1	NA	NA	None	SRA	None	
St. Susanna's	Priv.	Priv.	None	7	NA	NA	None	SRA	None	
Fairbanks House	Priv.	Priv.	None	3.2	NA	NA	Fee	GR, SRB	Good	
American Legion	Priv.	Priv.	None	4.1	NA	NA	None	SRB	None	
Animal Rescue League	Priv.	Priv.	None	19.3	NA	NA	None	SRA, SRB	None	
MIT	Priv.	Priv.	None	25	NA	NA	None	SRA	None	
Dedham Country Day	Priv.	Priv.	None	11.7	NA	NA	None	SRB	None	
Northeastern Univ.	Priv.	Priv.	None	20.2	NA	NA	None	SRA	None	
Ursuline Academy	Priv.	Priv.	None	27.6	NA	NA	None	SRA	None	
Noble & Greenough Sch.	Priv.	Priv.	None	115	NA	NA	Fee	SRA, SRB	None	Tennis, nature, hike, swim.
Dedham Comm. Assoc.	NP.	Priv.	None	8.8	NA	NA	Fee	SRB	Minimal	
Private Cemeteries	Priv.	Priv.	None	25.4	NA	NA	None	SRB	Perp.	
The Island	Priv.	Priv.	None	7	NA	NA	None	FP	None	
Wilson Mountain	Priv.	Priv.	None	92	NA	NA	None	SRA	None	On MDC acquisition list.
Border Meadows	Priv.	Priv.	None	24	NA	NA	None	FP	None	On MDC acquisition list.

DEDHAM OPEN SPACE PLAN INVENTORY
TABLE V-A

PARCEL NAME	OWNER SHIP	MANAGE MENT	FUNDS USED	ACRES	CONDITION	POT.	REC. ACCESS	ZONING	DEG. OF PROTECT.	DESCRIPTION/COMMENTS
B. PUBLIC NONPROFIT										
Wigwam Pond	Town	CC	None	16	NA	Low	Free	FP	Art. 97*	Boating, fishing, skating.
Wetlands	Town	CC	None	125	NA	Low	Free	FP	Art. 97	Boating, fishing, nature study
Little Wigwam Pond	Town	CC	None	50	NA	Low	Free	FP	Art. 97	Boating, fishing, nature study
Conservation Land	Town	CC	None	2	NA	Low	Free	FP	Art. 97	Hiking, nature study.
Conservation Land	Town	CC	None	3	NA	Low	Free	FP	Art. 97	Hiking, nature study.
Conservation Land	Town	CC	None	12	NA	Low	Free	SRB	Art. 97	Hiking, nature study.
Conservation Land	Town	CC	None	2	NA	Low	Free	SRB	Art. 97	Hiking, nature study.
Conservation Land	Town	CC	None	1	NA	Low	Free	SRB	Art. 97	Hiking, nature study.
Conservation Land	Town	CC	None	1	NA	Low	Free	SRA	Art. 97	Hiking, nature study.
Barnes Memorial Park	Town	Parks	None	15	NEEDS WK.	High	Free	GR	Art. 97	General outdoor recreation.
Churchill Place	Town	Parks	None	2	NEEDS WK.	Low	Free	GR	Art. 97	General outdoor recreation.
Town Common	Town	Parks	None	3	NEEDS WK.	High	Free	SRA, SRB	Art. 97	Natural area.
Paul Park	Town	Parks	None	7	NEEDS WK.	High	Free	SRB	Art. 97	Hiking.
Condon Park	Town	Parks	None	<1	NEEDS WK.	Low	Free	LM	Art. 97	Hiking.
Hartnett Square	Town	Parks	None	<1	NEEDS WK.	Low	Free	SRB	Art. 97	Triangular grassy plot.
Oakdale Square	Town	Parks	None	<1	NEEDS WK.	Low	Free	GR	Art. 97	Grassy plot.
Hyde Park St. Triangle	Town	Parks	None	2.5	NEEDS WK.	Low	Free	SRB	Art. 97	Small, grassy plot.
E. Dedham Passive Park	Town	Parks	None	0.125	NEEDS WK.	Low	Free	GM, LM, SRB	Art. 97	Grassy area along brook.
Gerish Triangle	Town	Parks	None	14	NEEDS WK.	High	Free	SRB	Art. 97	Small plot rear of Dedham Mall
Fairbanks Park	Town	Parks	None	7	NEEDS WK.	High	Free	FP, SRB	Art. 97	
Oakdale School	Town	Parks	None	3.2	NEEDS WK.	High	Free	SRB	Good	
Riverdale School	Town	Parks	None	16.7	NEEDS WK.	High	Free	GR	Good	
Greenlodge School	Town	Parks	None	5.2	NEEDS WK.	High	Free	SRB	Art. 97	
Capen School	Town	Parks	None	76.2	NEEDS WK.	Medium	Free	SRA	Art. 97	
Town Forest	Town	Town	None	18.2	NEEDS WK.	Medium	Free	SRB	Perp.	Hiking, nature study.
Endicott Estate	Town	Select.	None	10.6	NEEDS WK.	NA	Free	SRA, SRB	Art. 97	Walking, sledding, kites.
Miscellaneous	Town	Select.	None	46.9	NA	None	Free	RES.	Perp.	
Town Cemeteries	Town	Select.	None	7.7	NA	Low	None	BUS.	Art. 97	
Town Dump	Town	Select.	None	205.75	NA	Low	Free	FP	Art. 97	Hiking, nature study.
Neponset River Res.	State	MDC	State	193	NA	Medium	Free	FP	Art. 97	Hiking, nature study.
Charles River	State	MDC	State	17	NA	Medium	Free	SRB	Art. 97	Hiking, nature observation.
Dedham Parkway	State	MDC	State	50	NA	Medium	Free	SRA	Art. 97	Hiking, nature study.
Brookline Water Works	County	Co.	County	6.7	NA	Low	Free	FP, SRB	Art. 97	
Norfolk County	Army	Army	Fed.	224	NA	Low	None	FP	Ltd.	
Army Corps of Eng.	Priv.	Audubon	Priv.	12	NA	Low	None	SRA	High	Hiking, nature study.
Weld Pond	Priv.	Hist.	Priv.	17	NA	Low	None	FP, GR	High	Hiking, nature study.

* Article 97 of the state constitution.

NA = Not applicable. The town has not yet assessed the recreation potential of these parcels.

SECTION VI - COMMUNITY GOALS

Every planning study must be guided by a set of goals and objectives. A goal is a broad statement of purpose. An objective is a more specific statement of how to achieve or advance toward that purpose. The function of goals and objectives is to give focus to a plan. They are critical in developing recommendations and in the final selection of recommendations.

A. DESCRIPTION OF PROCESS

The goals and objectives for this study were initially derived from two surveys. The first survey was conducted by the Dedham League of Women Voters at an open space forum sponsored by the League in September, 1989. The second survey was conducted by the Dedham Open Space Committee at the April 1990 Town Meeting.

B. STATEMENT OF OPEN SPACE AND RECREATION GOALS

Seven major goals emerged from the two surveys and subsequent discussions by the Dedham Open Space Committee. The goals are as follows:

- o Preserve the Character of the Town of Dedham.
- o Protect Open Land.
- o Protect Natural Resources.
- o Provide Recreational Opportunities for All Residents.
- o Manage Existing Recreation and Conservation Lands for Maximum Benefits.
- o Increase Public Awareness and Support of Open Spaces.
- o Review Town Bylaws, Policies and Regulations to Determine their Impact on Open Space Preservation and Recommend Modifications Supportive of Open Space Goals.

The order of listing of these goals does not imply priority.

SECTION VII - ANALYSIS OF NEEDS

A. SUMMARY OF RESOURCE PROTECTION NEEDS

The open space survey (see below) identified the protection of water supplies, wetlands and forests as the highest priorities. Because Dedham relies on groundwater, protection of the wellfields is of the utmost importance. The achievement of the water quality standards for the Neponset and Charles rivers is also an important resource protection need. This cannot be accomplished solely through the efforts of a single community but there are many activities within the town which can effect the achievement of water quality. To reduce the incidence of flooding, attention must be paid to preserving all wetlands areas which serve as flood storage.

Another need which is reflected in the comments made by residents on the surveys is the need to preserve the town character. While every resident may have a slightly different idea about what constitutes town character, in general, the comments focused on the need to curb further commercial development, to include more open space in commercial development, to preserve the spacious institutions which provide a feeling of openness and to introduce more green space into residential neighborhoods.

B. SUMMARY OF COMMUNITY'S NEEDS

Results of the Open Space and Recreation Survey - The Dedham Open Space Committee distributed a survey (Appendix C) at the April Town Meeting. One hundred and forty-four surveys were returned. The survey asked a variety of questions about participation in outdoor activities, open space goals and what types of land to protect. All precincts were fairly evenly represented, with Precinct 8 having the highest number of returns (21).

The second question asked respondents to indicate which of eighteen activities they were most interested in. The five activities receiving the highest number of responses were bicycling, nature walks, running/jogging, baseball/football, and soccer. Also high on the list were swimming, tennis and picnicking. Despite Dedham's location on the Charles and Neponset rivers, boating and fishing received fewer responses (48).

78	swimming	7	trailbiking
48	boating	2	snowmobiling
48	fishing	88	running/jogging
88	nature walks	69	tennis
68	picnicking	87	baseball, football
8	camping	81	soccer, field hockey, lacrosse
30	cross-country skiing	37	track
32	dog exercising	9	target practice
92	bicycling	7	paddle tennis

When asked to rate five open space goals in the order of importance, the protection of resources such as water supplies received the highest number (93) of "most important" ratings. The preservation of open land in general received the next highest number of most important ratings (18) while only seven people felt that historic preservation was the priority. Wetlands and forests were the two types of undeveloped land that residents felt were most important to preserve.

Sixty-three percent of the respondents felt that open space and recreation land should be scattered throughout residential areas rather than concentrated in several locations.

Recreation Needs

The Director of Parks and Recreation was interviewed to determine current and future recreational needs. The town has not budgeted any money for park rehabilitation or improvements since 1980. The current budget is \$300,000 with half devoted to parks and the other half to recreation. Prior to 1980, the parks department budget was lower than comparable communities in the Boston area. Despite budgetary problems, the Parks and Recreation Department has managed to provide a wide variety of programs. These programs are described in Appendix B.

Despite the fact that the school age population has declined, enrollment in the recreation programs has held steady and has become very important to the lower and middle income population in the town. The enrollment in recreation programs during the 8 week summer session runs about 10,000 - 12,000 people per summer. Approximately 30,000 - 35,000 people use the pool during the summer months. There are specific programs for the special needs population during both the winter (at the high school) and during the summer at the playgrounds.

A major problem with the parks is overuse. With so few parks there is no opportunity to take one park out of use temporarily in order to rest the turf. The Parks and Recreation Department occasionally uses private facilities such as the Noble and Greenough School. There is a need for additional soccer, softball and baseball fields. There is no swimming area except for the town pool. The greatest need is for new playground equipment at Memorial Park. At least one additional park is needed for active recreation.

The recreation needs of the elderly are adequately met by the Council on Aging and other organizations serving the elderly. There is a need for more adult programs such as weight control, volleyball and aerobics.

C. NATIONAL STANDARDS FOR OPEN SPACE AND RECREATION

The use of standards to determine whether or not a community has adequate open space and recreation is difficult due to changing trends in recreation, demographic and socio-economic characteristics of the community. The National Recreation and Parks Association (NRPA) developed the most widely used standards for park and recreation land. Standards are given for three major categories: Local/Close-To-Home Space, Regional Park and Recreation Lands, Unique Local or Regional Space. The first category is the most relevant for local open space planning. It includes neighborhood parks and playgrounds providing active recreation, larger parks with more intensive recreational facilities and large parks with natural areas.

Local/Close-to-Home Space - This category provides population-based acreage standards for various categories of parks with an emphasis on active recreational facilities. The standard is 6.25 - 10.5 acres of developed open space per 1,000 population. This is further broken down into standards for mini-parks, neighborhood park/playgrounds and community parks. A copy of the NRPA standards can be found in Appendix D.

According to this general standard, Dedham should have 158 - 266 acres of active recreational facilities. Dedham clearly meets this requirement. However, it is important to look at the type and distribution of facilities rather than just the gross acreage.

The standards for mini-parks (1 acre or less,) recommend 6 - 12 acres. Dedham has four parks under an acre (Hartnett Square, Oakdale, Hyde Park and Gerish Triangle). This is less than the 6 - 12 acres recommended and these parcels are for the most part, undeveloped grassy plots.

The standards for neighborhood parks (15+ acres) recommend 24 - 47 acres and the standards for community parks (25+ acres) recommend 118 - 188 acres. The next level of parks in Dedham consists of four parks (Paul, Condon, Fairbanks, Barnes Memorial) which are mostly less than 15 acres and total 49 acres. Although in total acreage Dedham appears to meet the standards, the recreation director has stated that at least one other park is needed. He cited the overuse of ball fields as one of the major problems. Dedham does not have any community parks over 25 acres although it does have conservation lands of this size.

Regional Space - Regional Space has two components: regional/metropolitan parks and regional park reserves. These categories encompass open spaces of 200-1,000 acres that are within one hour's driving time, serve several communities, and provide recreation and/or natural resource protection. The population-based standards of 15-20 acres/1,000 population indicate

that Dedham should have access to approximately 379 - 506 acres of regional/metropolitan parks. The MDC's Blue Hills Reservation fulfills this need for Dedham.

Locally Or Regionally Located Open Space Unique to Each Community - This category includes linear parks, special use areas, and conservation areas. There are no population-based acreage standards provided for these categories. The definition of linear park includes hiking trails as well as canoeing. The Charles and Neponset Rivers qualify as linear parks or recreation resources. The NRPA defines conservancy areas as lands set aside for the "protection and management of the natural/cultural environment with recreation use as a secondary objective." The MDC lands along the Neponset and Charles Rivers fall within this category as well as town conservation lands.

D. MANAGEMENT NEEDS, POTENTIAL CHANGE OF USE

Maintenance - The survey indicated that residents would like to see better maintenance of the existing parks, including rehabilitation of the playing fields at the Capen and Oakdale schools. Several residents cited the need for better collection of glass and trash. Maintenance by the MDC of Riverdale Park was also mentioned.

Zoning and Development Controls - The survey results indicated that residents feel there is a need for tighter control over zoning and development. Several comments related to the need for tighter zoning and control over granting variances. Another resident felt that there should be a requirement for open space in all commercial developments.

E. THE SCORP PLAN

Every five years the state must prepare a Statewide Comprehensive Outdoor Recreation Plan (SCORP). The most recent SCORP Plan is entitled "For Our Common Good - Open Space and Outdoor Recreation in Massachusetts 1988-1992". The plan presents the state's goals and objectives for outdoor recreation for each five year period. This plan was based in part on an extensive supply and demand survey. The results of this survey are summarized for the MDC region, of which Dedham is a part, on Page 100 of the plan. On the supply side, the MDC region was found to be deficient in several key areas including field-based activities. This is a problem that Dedham shares with the region. Within this region, there was found to be a preference for maintaining existing recreation and conservation areas rather than developing new ones. The SCORP plan includes a summary of recommended actions in the MDC region.

SECTION VIII - GOALS AND OBJECTIVES

The following seven goals were determined through the process described in Section 6. The objectives were used to guide the development of the Five Year Action Plan.

GOAL #1: Preserve the Character of the Town of Dedham

- a) Preserve and protect Dedham's character and heritage by protecting scenic, historic, ecologically sensitive and recreation areas.
- b) Mitigate the impact of development, particularly large scale development, through zoning controls, landscaping requirements and other developmental regulations.
- c) Balance the increase in development with the enhancement of recreational and open space areas.

GOAL #2: Protect Open Land

- a) Acquire additional parcels of open land.
- b) Preserve forests.
- c) Protect land adjacent to water bodies.

GOAL #3: Protect Natural Resources

- a) Continue to enforce the existing local and state wetlands, floodplain and aquifer protection laws.
- b) Protect areas critical for water supplies.

GOAL #4: Provide Recreational Opportunities for all Residents

- a) Develop trails for jogging, biking and walking, working towards a network connecting various neighborhoods.
- b) Utilize abandoned railroad rights-of-way.
- c) Give due consideration to the needs of the handicapped.
- d) Provide recreational facilities for all age groups.

- e) Provide neighborhood recreational facilities scattered throughout the town.
- f) Improve access to the riverfront and to ponds.
- g) Increase the supply of playing fields for team sports.

GOAL #5: Manage Existing Recreation and Conservation Lands for Maximum Benefits.

- a) Improve access to conservation and recreation areas.
- b) Provide fiscal support for proper maintenance of recreational facilities.
- c) Work with the MDC to improve maintenance of their facilities.

GOAL #6: Increase Public Awareness and Support of Open Spaces through

- a) Education
- b) Encouragement of citizen groups for action and advocacy for improved recreational and open space areas.
- c) Use of land trusts and conservation restrictions.

GOAL #7: Review Town Bylaws and Pertinent Policies and Regulations to Determine their Impact on Open Space Preservation.

SECTION IX FIVE YEAR ACTION PLAN

The Five Year Action Plan is the most important section in any open space and recreation plan. The following recommendations are meant to bridge the gap between the existing open space and recreation resources identified in Section V, the goals and objectives (Section VIII) and the needs and desires of the residents of Dedham (Section VII). The designation of a target year is meant as a guide only. It is more important to be flexible and take advantage of opportunities as they arise. Certain actions are designated as ongoing because of the flexibility required to pursue a program of land acquisition. The basic components of the Five Year Action Plan are shown on Figure IX-A "The Action Plan".

A. FIRST YEAR (1991)

Publicize the Plan - The plan and its recommendations should be widely publicized. Copies of the plan should be available in public libraries and town buildings. The local newspapers should be encouraged to write articles about the plan both after its publication and on an on-going basis. (Goal #6)

Identify and Designate Scenic Roads - The town should develop a proposed list of roads to be designated under the scenic roads act. (Goal #1)

Establish a Permanent Open Space Committee - The implementation of the open space and recreation plan requires an on-going effort. The town should establish the Open Space Committee as a permanent committee to advocate for implementation of the open space plan. (Supports all goals)

Discuss Open Space with the Subregion - Dedham is a member of the MAPC subregion called the Three Rivers Inter-Local Council (TRIC). The town should initiate a meeting to discuss open space issues of interest. (Supports all goals)

B. SECOND YEAR (1992)

Investigate a Water Setback Bylaw - The planning board and conservation commission should investigate zoning bylaws which would require a setback from all rivers, streams and waterbodies. The setback would be determined based on the relationship of the water and land. (Goal #3)

Sponsor a Poster Contest - The town should sponsor a poster contest for schoolchildren with an environmental protection theme. (Goal #6)

Institute Adult Recreation Programs - The Recreation Department should undertake a pilot project to offer limited adult recreation programs to determine interest. This need has been identified by the Recreation Department. (Goal #4)

Study User Fees for Organized Sports - The Recreation Department should study the feasibility of instituting user fees for organized teams which use their facilities. (Goal #5)

Review all Vacant Parcels - The Open Space Committee should use the vacant lands inventory from the master plan to identify all parcels which might be suitable for future acquisition. (Goal #2)

Review Zoning Bylaws - The Open Space Committee should review the zoning bylaws to determine if there are any changes that could be made to enhance open space in town. (Goal #7).

Initiate Public Education Concerning the Real Estate Transfer Tax - Educate town residents about the proposed statewide real estate transfer tax enabling legislation. (Goal #6)

Meet with Major Institutions - Meet with representatives from major institutions (Northeastern, SMA Fathers, etc.) regarding long-term plans for properties. Encourage them to investigate tax breaks under Chapter 61B and development restrictions. (Goals #1,2,3,4)

C. THIRD YEAR (1993)

Evaluate Cluster Zoning - The planning board should study the feasibility of a cluster zoning bylaw to preserve open space without acquisition by the town. (Goals #1,2,3,4,7)

Evaluate Linkages Between Open Areas - The Open Space Committee should evaluate linkages between existing and proposed open spaces and parks using additional acquisitions, abandoned railroad rights-of-way and roads. (Goals #4,5)

Study Re-Use of Railroad ROW - The town should study the potential development of the abandoned railroad tracks for a trail. (Goal #4)

D. FOURTH YEAR (1994)

Initiate Plan Update - The Open Space Committee should undertake an update of the plan at the end of the fourth year to ensure continued eligibility for state funding. (Supports all goals)

Improve Canoe Access - Improve access for canoes at the Town Landing, or elsewhere on the river, as appropriate. (Goal #5)

E. FIFTH YEAR (1995)

Investigate Scenic Easements - Meet with landowners in the western portion of town to discuss the possibility of obtaining scenic easements in the area identified in the DEM Scenic Landscapes Inventory. (Goal #1)

F. ONGOING

Initiate a Yearly Plan Review - The Open Space Committee should review the plan every year. The plan should be updated as new information arises. This will facilitate revising the plan at the end of the fifth year to maintain eligibility for state funding. (Supports all goals)

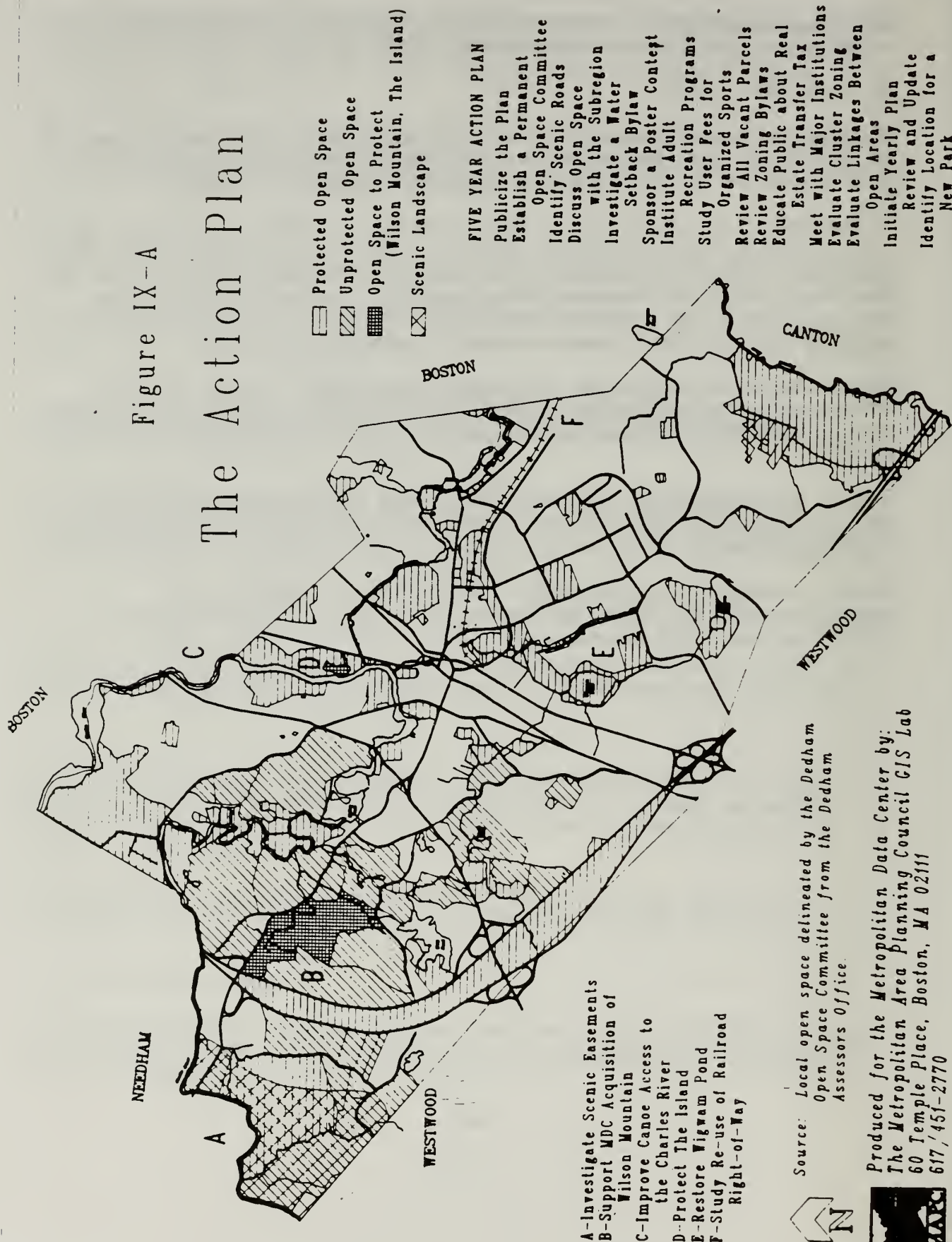
Enforce Existing Regulations to Restore Wigwam Pond - Enforce existing environmental regulations to prevent further pollution of Wigwam Pond and to allow the pond to restore itself through natural processes. (Goals #2,3,5)

Support MDC Aquisitions - All town boards and the Open Space Committee should work with the MDC to support the acquisition of Wilson Mountain and the Border Meadows.

Identify Location for a New Park - The Open Space Committee, in cooperation with the Parks Department, should begin the process of identifying parcels for a new park.

Figure IX-A

The Action Plan



SECTION X - IMPLEMENTATION TECHNIQUES

A. INTRODUCTION

The public acquisition of conservation land is only one way to preserve and protect open space. There are many other ways to protect open land, town character, and environmental features. Acquisition is not always the most appropriate or cost-effective method. This section will describe a variety of techniques available, including those already being used in the Town and those that might be tried in the future. The purpose of this section is to make decision-makers and town residents aware of the many different ways to preserve open land. These techniques can be used to help implement the Five Year Action Plan.

The SCORP Plan contains a wealth of information on planning techniques and programs which can be used to implement open space plans. Volume II, Chapter 2 of the Plan is entitled "Planning for the Protection of Our Resources". That chapter briefly describes 100 environmental resource protection tools under the categories of general resource protection, wetlands, tidelands, aquifer/watershed areas, rivers, coastal facilities, critical habitats, cultural/historic resources, scenic resources, agricultural land and growth management techniques.

B. STATE AND FEDERAL FUNDING PROGRAMS

The Self-Help Program - This program, administered by the Division of Conservation Services, provides for up to 80% reimbursement of the costs of acquiring land for conservation and passive recreation. In order to be eligible, a municipality must have an established conservation commission and must have an open space/conservation and/or recreation plan approved by the Division of Conservation Services. The purpose of this program is to preserve lands and waters in their natural state. The funds cannot be used to develop recreational facilities.

The Urban Self-Help Program - This program, administered by the Division of Conservation Services, provides funding to cities and urban towns for reimbursement of up to 90% of the cost of acquiring land for park and recreation purposes. The funds may also be used to develop outdoor recreational facilities. In order to be eligible, a city or town must have a Park or Recreation Commission and a conservation commission, as well as an open space/recreation plan approved by the Division of Conservation Services.

The Land and Water Conservation Fund Program - This is a federal program

that is administered in Massachusetts by the Division of Conservation Services. The program allows for reimbursement of up to 50% of the costs of acquiring and/or developing land for outdoor recreation. Projects must be consistent with the SCORP (Statewide Comprehensive Outdoor Recreation Plan).

Agricultural Preservation Restrictions (APR) - The APR Program was begun in 1977 to protect the state's diminishing farmland. Under this program, the Department of Food and Agriculture (with or without financial assistance by the town) purchases the development rights to a farm. A private, non-profit organization may also acquire an APR. The program is voluntary and is initiated by the landowner by filing an application with the Department of Food and Agriculture. The review process includes field inspection, screening, and selection based on set criteria and appraisals. The Agricultural Lands Preservation Committee determines what final action should be taken. The conservation commission must also review the application and make a recommendation to that committee.

If approved, the state (and in some cases, the town) acquires deed restrictions that run in perpetuity. The restriction prohibits all activities that would impair the land for farming. The farm remains privately owned and the owner retains the right to privacy, the right to sell or lease the land, and the right to farm. However, the landowner cannot be required to continue to farm. There is no public access required except for the state's right to enforce the restriction.

The state evaluates the farms for inclusion in the program based on the following criteria:

- 1) quality of soils for agricultural production;
- 2) the extent to which the farm is threatened by development pressure;
- 3) whether the farm has any statewide significance;
- 4) the degree to which the farm is isolated or is near other farms in the APR Program.
- 5) the operations and management of the farm;
- 6) whether the farm meets the eligibility requirements for inclusion in the Chapter 61A program.

An APR cannot be released unless the holder, the Commissioner of Food and Agriculture, and the selectmen consent, after a public hearing, or by a two-thirds vote of the legislature. The owner also must repay a sum equal to the market value of the APR at the time of release. As long as the land is actively farmed it will be assessed at the rates set for the Chapter 61A program. State and federal taxes also are lowered due to the loss of development potential.

C. OTHER LAND PRESERVATION TECHNIQUES

Chapters 61, 61A, and 61B

These three statutes provide a way for land owners to reduce property taxes on eligible farm, recreation and forest land. This lowered tax assessment also serves to keep these lands undeveloped. All of these programs are voluntary and are entered into at the will of the property owner. This section, reprinted from the publication "Charitable Gifts of Land and Conservation Restrictions" briefly outlines the requirements and responsibilities involved in participation in these two programs.

Chapter 61: Forest Land

- . The landowner must enroll at least 10 contiguous acres of forest not developed for non-forest use.
- . The landowner must furnish a 10-year forest management plan prepared by a professional forester. A state forester will review the plan and visit the property before certifying eligibility.
- . The state-certified plan is then submitted to the local assessor for a special forestland classification. Classified land is assessed at 5% of its fair market value, with a \$10 minimum assessed value. The normal town tax rate is applied to find the amount of property tax due.
- . The landowner must pay a "products tax" equal to 8% of the stumpage value of wood products harvested during the eligibility period and for two years prior to eligibility.
- . If the landowner withdraws from the program or fails to comply with the management plan, he must repay all taxes which were saved while in the program (up to 10 years), plus interest. The penalty will not apply if the owner sells the property, and the new owner agrees to assume the burdens and benefits of the program. However, the town is given a 120-day right of first refusal to purchase the property, if it wishes to match the purchase offer.

Chapter 61A: Agricultural and Horticultural Land

- . The land must be actively devoted to agricultural or horticultural uses during the present tax year and for the previous two tax years. Agricultural and horticultural uses include raising animals, food for human or animal consumption, tobacco, flowers, plants, and shrubs or forest products for sale in the regular course of business.

- . The landowner must enroll at least 5 acres, and show gross sales of at least \$500 per year in agricultural/horticultural products, plus \$5.00 per acre for each acre over 5 (50.cents per acre if wetland or woodland).
- . A conveyance tax is due if the owner sells the property for use other than in agriculture or horticulture, or if the use is changed by the owner within 10 years. The tax equals 10% of the total sales price in the first year, 9% in the second year, 8% in the third year, and so forth. No conveyance tax is due if the land is sold for and retained in agricultural or horticultural use.
- . If enrolled land ceases to be eligible, the owner must repay all taxes saved during the current and preceding four tax years. If the conveyance tax is greater than the rollback tax, the owner pays the former (but not both).
- . In the event of a proposed sale, the town has a 120-day right of first refusal to match the purchase price. If it elects to make the purchase, no conveyance tax or rollback tax is due.
- . All buildings and houselots are assessed normally.

(Source: Charitable Gifts of Land and Conservation Restrictions: A Landowner's Guide to Massachusetts and Federal Tax Incentives, by Cartland Bacall and Darby Bradley; The Essex County Greenbelt Association and The Trustees of Reservations, 1984)

Chapter 61B: Recreational Land and Open Space

- . Chapter 61B relates to the classification and taxation of recreational lands. To qualify, a parcel must be at least five acres and must remain in a natural, wild, or open condition or be devoted to recreation.
- . Recreational uses include hiking, camping, nature study, boating, golfing, horseback riding, hunting, fishing, skiing, swimming, picnicking, flying, archery, and target shooting.
- . The valuation of land under Chapter 61B shall not exceed 25% of its fair cash value.
- . There are provisions similar to Chapter 61 and 61A for paying roll-back taxes when the use changes. The municipality has a 180 day right of first refusal period (as opposed to 120 days for Chapter 61 and 61A) when the land is put up for sale.

Conservation Restrictions (CR)

A Conservation Restriction is a legally binding agreement between a land-owner and a public agency or non-profit land trust, where the land-owner agrees to keep the land undeveloped and in its natural state. CRs can be a good alternative to fee simple acquisition of land. However, if a restriction is sought involving the limited use of buildable land, the cost of a restriction may equal the cost of fee simple acquisition. CRs are useful when an undisturbed green belt is desired along streams or other natural features. A CR can take the form of a scenic easement to prevent development on ledges, hilltops, or fields to preserve views. Short-term restrictions (of 10-30 years) also are permitted by the Conservation Restrictions Act and can help a town control growth and allow it to plan for land acquisition in advance of a property coming on the market.

Property owners, as well as conservation commissions, can benefit from CRs. However, many landowners who are interested in open space preservation may not fully understand the financial benefits, responsibilities, and requirements for granting a conservation restriction. It is important to note that the tax implications of a CR are somewhat complicated, and this brief discussion cannot take the place of professional advice. Many of the benefits described here pertain to charitable gifts of land as well. A more detailed discussion of these issues can be found in the publication entitled "Charitable Gifts of Land and Conservation Restrictions: A Landowner's Guide to Massachusetts and Federal Tax Incentives."

A conservation restriction can reduce federal income taxes, federal and state capital gains taxes, local property taxes, and estate and gift taxes. Massachusetts does not allow a deduction in state income taxes for CRs. The tax savings is dependent on the value of the property being restricted. This is usually determined by calculating the difference in value before and after the restriction. This should be done by a qualified appraiser familiar with the Internal Revenue Code.

If a partial interest in land such as a conservation restriction is to qualify for tax benefits, it must be for a bona fide conservation purpose in accordance with Internal Revenue Service guidelines. Since the municipality and the state Division of Conservation Services must review and approve all perpetual conservation restrictions, this approval usually satisfies IRS guidelines.

Public access to the restricted land is not required although it does help to fulfill the requirement that the restriction provide a public benefit. A land-owner who allows public recreational use and does not charge a fee

is not liable for injuries to persons or property under Chapter 21, Section 17C of the Massachusetts General Laws. Landowners should be aware that a restriction can only be released after a public hearing and with the approval of the holder, the town meeting, the Division of Conservation Services, and the Secretary of the Executive Office of Environmental Affairs.

The Real Estate Transfer Tax

A potential new tool for funding open space acquisition is currently being considered by the State Legislature. The Land Bank Bill (also known as the Real Estate Transfer Tax), if passed, would allow municipalities the option of establishing land banks funded by a tax on real estate sales. The bill is patterned after the Nantucket Land Bank legislation which was passed in 1983. The bill has been revised and debated for several years but the basic principals are as follows: 1) Each city or town would have the option of approving the land bank concept by a town meeting vote. 2) A tax of up to a set percentage would be imposed on real estate sales. 3) The city or town could vote to exempt a certain amount of any real estate sale from the fee. 4) The funds could be used for acquisition, planning or management of open space land and would be administered by the conservation commission or a Land Bank Commission. The legislation currently under consideration also mandates that a certain percentage of funds collected be spent on affordable housing. Until such time as the legislation is acted on, the Land Bank option should be considered a future implementation technique which may become available to the town.

Transfer of Development Rights

A TDR program is a regulatory technique that influences the location of development and compensates for the inequities that may arise when the use of property is restricted due to land-use regulations. A TDR program separates the right to develop a parcel of land from that particular property and allows that right to be transferred to another parcel of land. This is done by designating the area to be preserved as the "sending zone" and the area to be developed as the "receiving zone." A property owner in the sending zone can sell development rights to a property owner in a receiving zone. This technique is relatively new and can be difficult to implement, but it has been used in Concord, Bedford, and Falmouth.

SECTION XI - PUBLIC COMMENTS

A copy of the draft plan was distributed to the following groups on January 16, 1991:

Board of Selectmen

Planning Board

Zoning Board of Appeals

School Committee

Conservation Commission

Recreation Commission

Comments were received from the Board of Selectmen and the Planning Board. The plan was written with the assistance of the Metropolitan Area Planning Council; therefore comments were not solicited from them.



TOWN OF DEDHAM

(COMMONWEALTH OF MASSACHUSETTS)

PLANNING BOARD

Telephone:
617-326-5838

January 30, 1991

Open Space Plan Committee
c/o Ms. Joan Blaustein
Metropolitan Area Planning Council
60 Temple Place
Boston, MA 02111

Dear Committee Members:

The draft Dedham Open Space Plan prepared by you with assistance from the MAPC has been reviewed by the Planning Board.

We are generally in agreement with the Plan and recommend its adoption and implementation by the town. It is the intention of the Planning Board to formally approve the final Plan and incorporate it as an element of the Town Master Plan.

There are a number of specific comments and suggestions, which we hope will be given favorable consideration by you and used in the final Plan. Most of them are technical in nature, however the following comments are worthy of specific mention:

1. The Planning Board is opposed to the creation of a permanent Open Space Committee whose functions will be largely duplicative of the Conservation Commission, the Planning Board, the Selectmen, and the Town Planner.
2. Active recreation is not inventoried or analyzed in the Plan. It should either become a significant element of the plan or be omitted entirely.
3. If acquisition of more open space is recommended, some parameters should be stated, such as identification of the key parcels, or annual cost in dollars or as percentage of town budget, or desirable total additional acreage, or under which conditions would the town be justified in expending tax dollars to buy open space. You may be aware of the power of the Planning Board to set aside park land in any new subdivision. Such land must be purchased by the town within three years or the set-aside lapses.

Open Space Plan Committee
c/o Ms. Joan Blaustein

January 30, 1991
page 2

We commend the Committee and Ms. Blaustein on a big job well done, and we express our appreciation of MAPC assistance, in particular the computer-generated thematic maps.

Sincerely,

DEDHAM PLANNING BOARD

Paul T. D'Attilio,
Chairman

PTD'A:ac
Enc.

ANTHONY V. TAURASI, JR., CHAIRMAN
FRANK J. GEISHECKER, VICE-CHAIRMAN
MARIE-LOUISE KEHOE
GEORGE R. BOYLEN
STEPHEN P. RAHAVY



ANNETTE M. BELLANTI
EXECUTIVE SECRETARY
(617) 327-5770
FAX (617) 461-5992

TOWN OF DEDHAM

(COMMONWEALTH OF MASSACHUSETTS)

BOARD OF SELECTMEN

March 19, 1991

Ms. Joan Blaustein
Metropolitan Area Planning Council
60 Temple Place
Boston, MA 02111

Re: Dedham Open Space Plan

Dear Ms. Blaustein:

On behalf of the Dedham Board of Selectmen, I would like to thank you and the Metropolitan Area Planning Council for your help in preparing the 1991 Open Space Plan. Our thanks go also to the members of the Open Space Committee for many hours of dedicated work on the Plan.

The Board of Selectmen is particularly cognizant of the extensive work that went into the historical, inventory, and program description parts of the Open Space Plan, and the computer-drafted thematic maps.

The Board agrees in general with many of the recommendations of the Plan and intends to use the Plan as a guide for the preservation of open space in the Town of Dedham. There are some specific recommendations which the Board may modify or the application of which may be postponed. This may be due to financial considerations or because of relatively lower priority compared to other policies and objectives of the Board of Selectmen and of other entities charged with planning for and preservation of open space, especially the Planning Board and the Conservation Commission.

The recommendations of the Plan relative to active sports and recreation appear to be based mainly on responses to questionnaires and not on an inventory and analysis of the existing facilities, including those based on schools. More substantiation and specificity will be needed to justify adoption of these recommendations.

Given the current budget and resource limitations, we believe it would be a mistake to leave the implementation of the Open Space Plan to an "outside" committee; instead, the implementation should be the responsibility of the Board of Selectmen, Planning Board, and the Conservation Commission, who have the requisite statutory powers and can best relate the Open Space Plan to other resources and need of the Town.

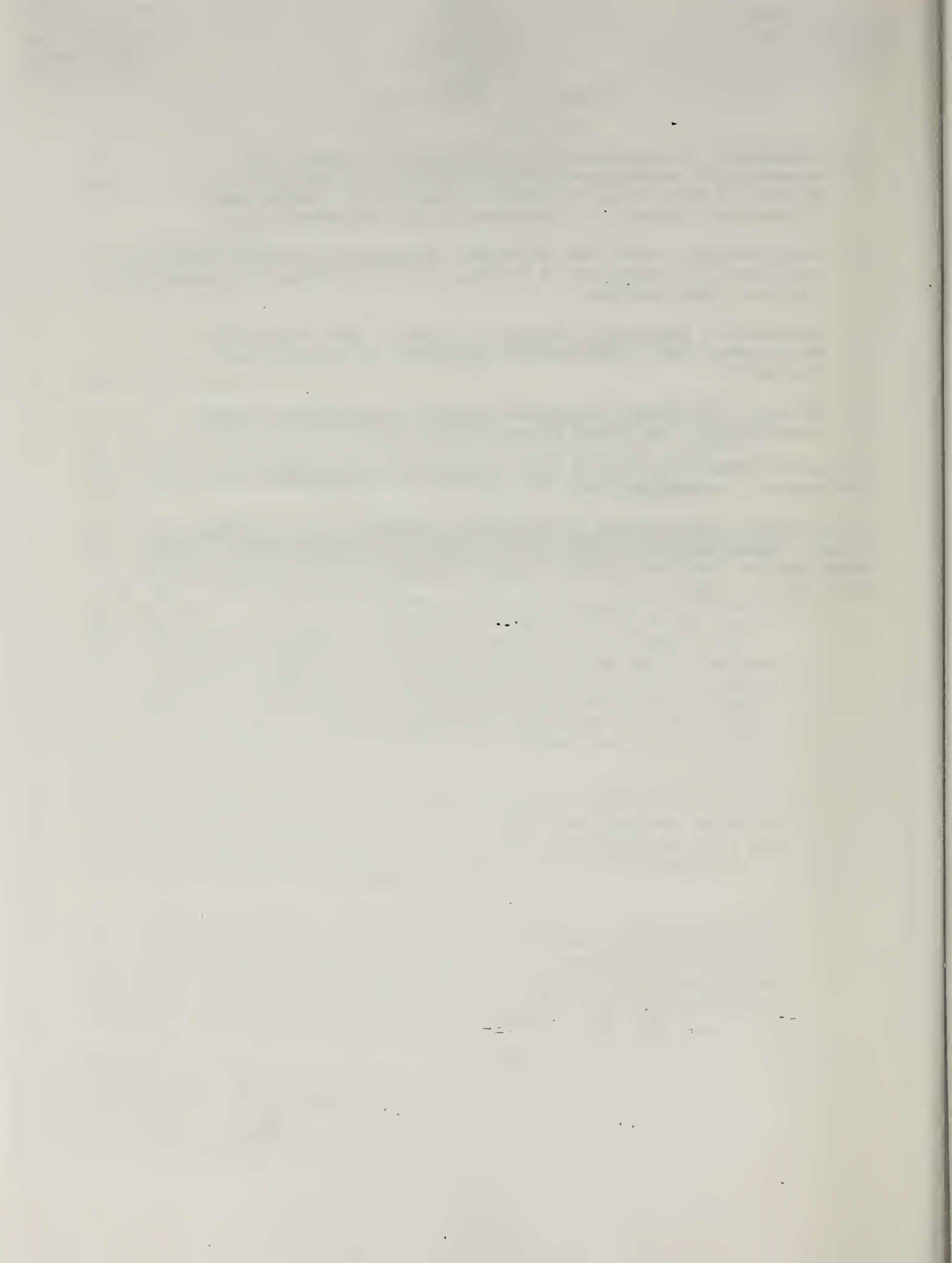
Sincerely,

Anthony V. Taurasi, Jr.
Chairman *hab*

Board of Selectmen

SECTION XII - REFERENCES

- 1) Commonwealth of Massachusetts Summary of Water Quality 1988
Massachusetts Department of Environmental Quality Engineering,
Division of Water Pollution Control Appendix III- Basin/Segment
Information, Appendix IV - Non-point Source Assessment Report
- 2) Flood Insurance Study, Town of Dedham, Massachusetts Norfolk County,
June 1978, U.S. Department of Housing and Urban Development, Federal
Insurance Administration.
- 3) Massachusetts Landscape Inventory: A Survey of the Commonwealth's
Scenic Areas, 1982, Massachusetts Department of Environmental
Management.
- 4) Geology of the Norwood Quadrangle, Norfolk and Suffolk Counties,
Massachusetts. Geological Survey Bulletin 1163B
- 5) "For Our Common Good 1988 - 1992", Prepared by the Department of
Environmental Management, 1988.
- 6) Charitable Gifts of Land and Conservation Restrictions: A Landowner's
Guide to Massachusetts and Federal Tax Incentives, by Cartland Bacall and
Darby Bradley; The Essex County Greenbelt Association and The Trustees of
Reservations, 1984.



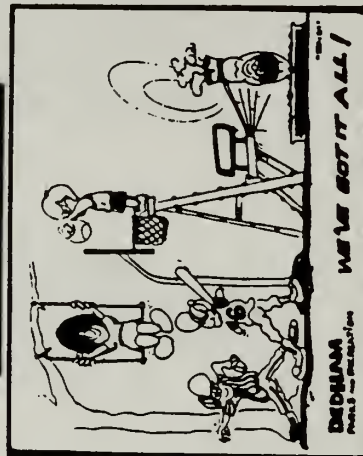
APPENDIX A
RARE AND ENDANGERED SPECIES

Natural Heritage and Endangered Species Program
Div. of Fisheries and Wildlife, 100 Cambridge St, Boston, MA
Rare Species Occurrences in Dedham (as of 5/90)
Grouped by DFW Rank

Scientific Name	Common Name	First Obs.	Last Obs.
** DFW rank: E			
CROTALUS HORRIDUS	TIMBER RATTLESNAKE	17--	17--
ELEOCHARIS OBTUSA VAR OVATA	OVATE SPIKE-RUSH	1878	1878
SCIRPUS LONGII	LONG'S BULRUSH	ND	ND
WILLIAMSONIA LINTNERI	BANDED BOG SKIMMER DRAGONFLY	1912	1912-05-20
** DFW rank: T			
ARETHUSA BULBOSA	ARETHUSA	1890	1890
ASCLEPIAS PURPURASCENS	PURPLE MILKWEED	ND	ND
ASCLEPIAS VERTICILLATA	LINEAR-LEAVED MILKWEED	1883	1884-08-24
OPHIOGLOSSUM VULGATUM	ADDER'S-TONGUE FERN		1884-07-13
RHODODENDRON MAXIMUM	GREAT LAUREL	1900	1900-06
VIOLA BRITTONIANA	BRITTON'S VIOLET	1902	1918-06-20
* DFW rank: SC			
LEMYS GUTTATA	SPOTTED TURTLE	1986	1986-05-18
* DFW rank: - H			
ASTILLEJA COCCINEA	INDIAN PAINTBRUSH	1885	1900-06
* DFW rank: --			
OTAMOGETON LATERALIS	A PONDWEED	S	1880-08-02

APPENDIX B
PARKS AND RECREATION DEPARTMENT PROGRAMS

1990



RESEARCH PLAN A RECREATION COMMISSION

DATE 10/11/2007 10:11 AM

WIC SPADA

MARION KELLY

JOHN FLYNN

A. P. "JOJO" MUCKLAACK 10. DIRECTOR
ELAINE CONNOLLY... ADMIN. ASST.

[illegible]

0446-199 MOBILE/STATION INVESTIGATION

0461 120000 120000 120000 120000 120000

Persons using any fields in the Town of Sudbury must have a Field Permit issued by the Park & Recreation Department. Any Sudbury Resident may obtain a permit at the Park & Recreation Office on the lower level of the Sudbury Town Hall.

DEPARTMENT OF RECREATION
SUMMER PROGRAMS 1990

151111A (Age 3-31) Moody Marriage 11

SUNDAY 18 (Age 2-3) Tuesday Morning 11:15 to Noon
 MONDAY 2A (Age 3-4) Wednesday Morning 11:15 to Noon
 THURSDAY 2B (Age 3-4) Thursday Morning 11:15 to Noon
 All the above SUNDAY Program run 9 weeks... (one season per week)
 Registration Fee to \$52.00 with a Pool Membership and \$18.00 without.

ORDERS INFORMATION CLIPPETS SEND WITH YOUR

WILLIAM MICHAEL CLIPPER SUPERVISOR TEAM

4TH OF JULY ROAD RACE (6.2 MILES)

WJF:.....June 11th thru June 22nd

The Race will be run with 10 divisions as follows: Men's Open; Women's Open; Boy's High School; Girls High School; Men's Varsity Sub-Fleet; Boys' Varsity Sub-Fleet; Men's A.V. and Women's A.V. and Men's and Women's Abbott Road (near the DuPont Middle School) at 10 am.

(Ages 30-39); Men and Women's Master (Ages 40 & Over) Men and Women's Race Walk and Team Championship. Entry Fee is \$5.00/4.00 for Deaf and Deafblind. Fee will be \$5.00 for everyone the day of the race. Little accidents. Fee will be accepted until 8 a.m. on the 5th. Please

Will be awarded. \$100.00 Gift Certificates for the Men and Women's Open Weeks.

Afternoon Total... 925.00 with Membership...

REGISTRATION FOR ALL POOL AND RECREATION PROGRAMS WILL BEGIN ON THURSDAY MAY 17TH. YOU MAY REGISTER AT THE POOL AND RECREATION OFFICE DURING THE FOLLOWING HOURS.....

from May 19th to June 14th.
At the Pool.....Mon-Fri 3-5; Mon.....Sat & Sun 1-4pm

[illegible]

INFORMATION SUPPER OFFICE HOURS.....PLANTING MONDAY JUNE 15, 1942
 MONDAY TUES FRIDAY.....8:30AM-1PM.....DESIKAM POOL

References

INTER-CLASPOOR ACTIVITIES

750.00

RESIDENT 12 CITIZEN	60.00	65.00	15.00
NON-RESIDENT FAMILY	170.00	150.00	20.00

REPORT OF THE PARKS AND RECREATION COMMISSION

The Dedham Park and Recreation Commission is a five-member elected Board, whose function is to oversee and supervise, when necessary, any program that comes under the jurisdiction of the Parks and Recreation Department.

Anthony Mucciaccio Jr., the full-time Park & Recreation Director, administers the Recreation Programs and directs and supervises the three (3) full-time Park Department employees. A full-time secretary handles all clerical work within both departments and assists the Director. The Commission meets the third Monday of each month at the Town Administration Building.

In March, Nicholas Spada was elected to a 3-year term and was welcomed to the Board. Thomas Polito resigned from the Commission after being elected to the Dedham School Committee and Albert Kiser was appointed to fill the vacancy. In September, Robert Donovan retired from the Commission after many years of outstanding service and John Flynn was appointed to fill the vacancy.

RECREATION PROGRAMS

Pool — The Dedham Pool, located at the rear of Dedham High School, is still being administrated and maintained on a self-supporting basis by the Parks and Recreation Department since July 1984.

Total Pool receipts for 1989 were \$91,721.46. Total Attendance for the year not including swim teams was 116,219.

Playgrounds — The summer playground ran smoothly for eight (8) weeks under the direction of Lisa Nelson, Playground Director. Playgrounds were staffed at Oakdale, Riverdale, Condon and Paul/Capen. Total playground attendance was 13,618.

Other programs sponsored by the Recreation Department for the year were as follows:

Gymnastics pre-school to Grade 8	690
Men's Slo-Pitch Softball	12 Teams 240
Women's Softball	8 Teams 120
Friday Nite Club (Special Needs)	40
Tennis Program	160
Summer Special Needs Program	50
Weight Program	75
Women's Water Aerobics	35
Women's Aerobics	40

Total Fees collected by the Department including the Pool were \$107,215.00.

The Dedham Triathalon which ran in June drew over 200 participants.

The Fourth of July Road Race was again directed by Richard Hart and drew 300 runners from Dedham and surrounding communities.

The Dedham Games for Special Needs Children took place in August at Stone Park with over 400 special needs children from Dedham and 8 surrounding communities. Thanks to the volunteers, this heart-warming event was a huge success.

The 21st Annual Flag Day Parade returned after a year's absence and was viewed by an estimated 6,000 spectators.

The 3rd Annual Bike Rodeo sponsored in conjunction with the Dedham Police Department drew over 250 youths from Dedham.

APPENDIX C
OPEN SPACE AND RECREATION SURVEY

THE TOWN OF DEDHAM, MASSACHUSETTS

DEDHAM OPEN SPACE SURVEY

In order to receive aid through one of several programs administered by the State Conservation Services, the town of Dedham must submit a conservation and/or recreation plan. Your response to this questionnaire is important. Your opinions will be used to form the goals of the plan.

1) What precinct reporting? _____

2) Which of the following activities are of the most interest, and in which is there the most participation? (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> swimming | <input type="checkbox"/> trailbiking |
| <input type="checkbox"/> boating | <input type="checkbox"/> snowmobiling |
| <input type="checkbox"/> fishing | <input type="checkbox"/> running/jogging |
| <input type="checkbox"/> nature walks | <input type="checkbox"/> tennis |
| <input type="checkbox"/> picnicking | <input type="checkbox"/> baseball, football |
| <input type="checkbox"/> camping | <input type="checkbox"/> soccer, field hockey, lacrosse |
| <input type="checkbox"/> cross-country skiing | <input type="checkbox"/> track |
| <input type="checkbox"/> dog exercising | <input type="checkbox"/> target practice |
| <input type="checkbox"/> bicycling | <input type="checkbox"/> paddle tennis |

Other _____

3) Please rate the following open space goals in what you see as the order of importance. ("1" for most important - "5" for least important)

- ☐ protection of resources such as water supplies
- ☐ protection of historic sites
- ☐ development of new parks, playgrounds, playing fields.
- ☐ preservation of open land in general
- ☐ increased management of existing town-owned land.

4) How would you rate the importance of preserving the following types of undeveloped land?

	<u>Importance</u>		
	High	Moderate	Low
Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freshwater Access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) Do you think planned open space and recreation land should be:
(Show priority by checking only one)

- ☐ scattered throughout residential areas
☐ in large parcels most likely concentrated in only several locations

6) Expand your response on question No. 5 if you wish to add further opinion.

7) Do you have suggestions for improving or adding open space or recreation facilities in your district? _____

Thank you for returning this questionnaire to: Open Space Committee
Room 212, Town Office Bldg.
Dedham, Ma 02026

A Recommended Classification System for Local and Regional Recreation Open Space

56

This classification system is intended to serve as a *guide* to planning—not as an absolute blueprint. Sometimes more than one component may occur within the same site (but not on the same parcel of land), particularly with respect to special uses within a regional park. Planners of park and recreation systems should be careful to provide adequate land for each functional component when this occurs.

NRPA suggests that a park system, at a minimum, be composed of a "core" system of parklands, with a total of 6.25 to 10.5 acres of developed open space per 1,000 population. The size and amount of "adjunct" parklands will vary from community to community, but *must* be taken into account when considering a total, well-rounded system of parks and recreation areas.

COMPONENT	USE	SERVICE AREA	DESIRABLE SIZE	ACRES/1,000 POPULATION	DESIRABLE SITE CHARACTERISTICS
A. LOCAL/CLOSE-TO-HOME SPACE:					
Mini-Park	Specialized facilities that serve a concentrated or limited population or specific group such as tots or senior citizens.	Less than ¼-mile radius.	1 acre or less	0.25 to 0.5A	Within neighborhoods and in close proximity to apartment complexes, townhouse development or housing for the elderly.
Neighborhood Park/Playground	Area for intense recreational activities, such as field games, court games, crafts, playground apparatus area, skating, picnicking, wading pools, etc.	¼ to ½-mile radius to serve a population up to 5,000 (a neighborhood).	15+ acres	1.0 to 2.0A	Suited for intense development. Easily accessible to neighborhood population—geographically centered with safe walking and bike access. May be developed as a school-park facility.
Community Park	Area of diverse environmental quality. May include areas suited for intense recreational facilities, such as athletic complexes, large swimming pools. May be an area of natural quality for outdoor recreation, such as walking, viewing, sitting, picnicking. May be any combination of the above, depending upon site suitability and com-	Several neighborhoods. 1 to 2 mile radius.	25+ acres	5.0 to 8.0A	May include natural features, such as water bodies, and areas suited for intense development. Easily accessible to neighborhood served.

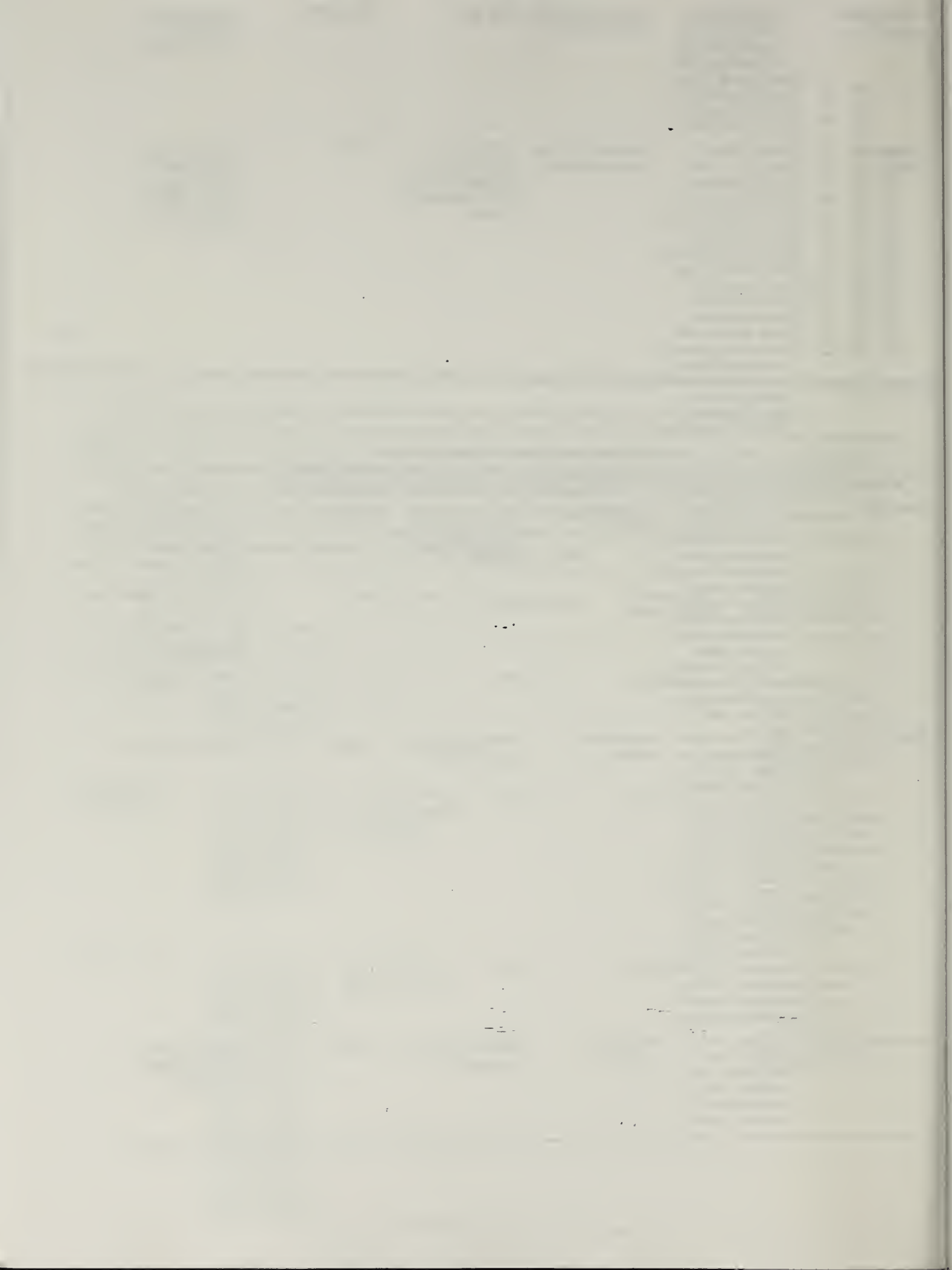
TOTAL DEVELOPED OPEN SPACE - 6.25 TO 10.5 ACRES/1,000

Regional/Metropolitan Park	Area of natural or ornamental quality for outdoor recreation, such as picnicking, boating, fishing, swimming, camping, and trail uses; may include play areas.	Several communities. 1 hour driving time.	200+ acres	5.0 to 10.0A	Contiguous to or encompassing natural resources.
Regional Park Reserve	Area of natural quality for nature-oriented outdoor recreation, such as viewing, and studying nature, wildlife habitat, conservation, swimming, picnicking, hiking, fishing, boating, camping, and trail uses. May include active play areas. Generally, 80% of the land is reserved for conservation and natural resource management, with less than 20% used for recreation development.	Several communities. 1 hour driving time.	1,000+ acres; sufficient area to encompass the resource to be preserved and managed.	Variable	Diverse or unique natural resources, such as lakes, streams, marshes, flora, fauna, topography.

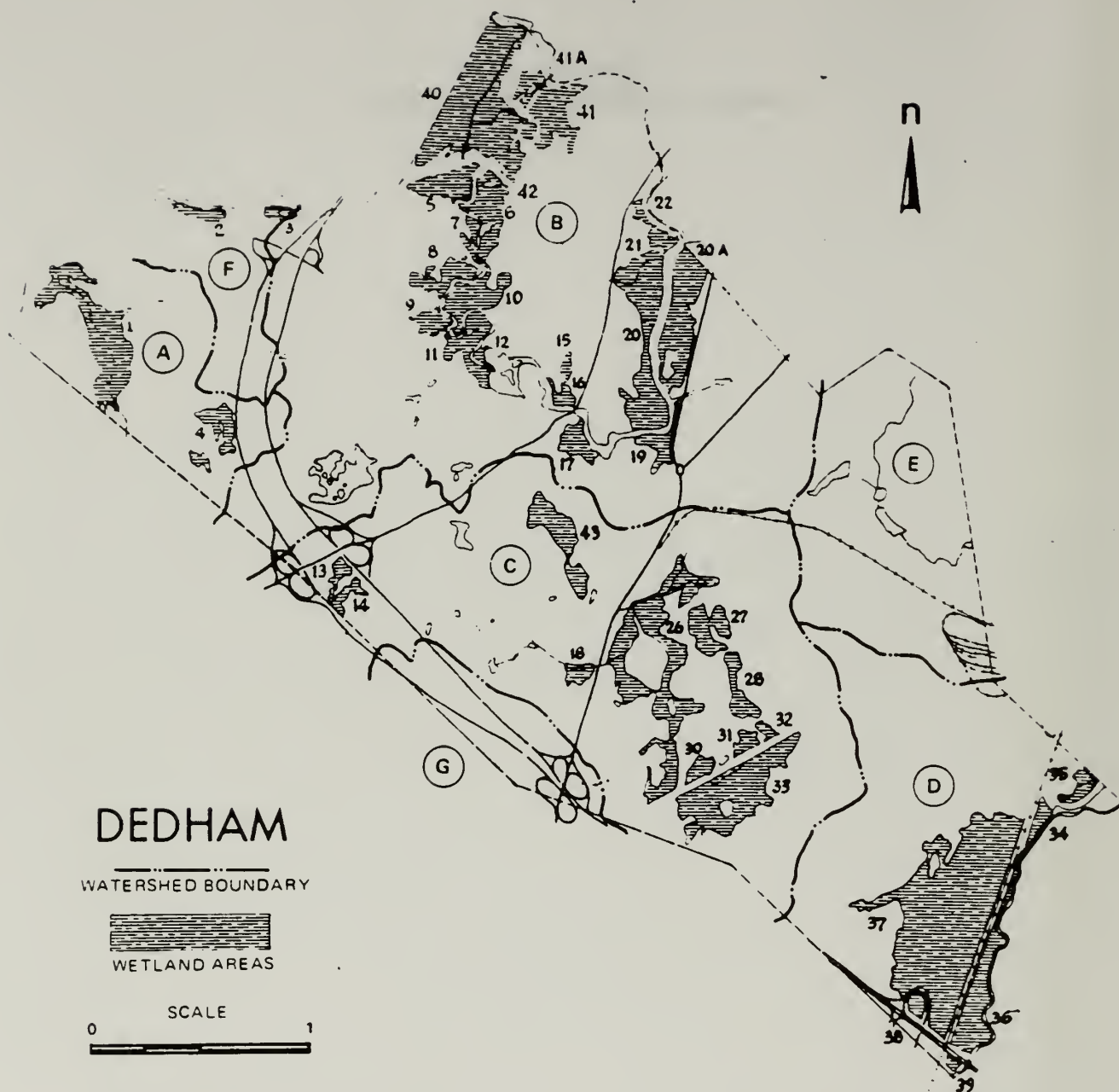
TOTAL REGIONAL SPACE = 15-20 A/1,000

C. SPACE THAT MAY BE LOCAL OR REGIONAL AND IS UNIQUE TO EACH COMMUNITY:

Linear Park	Area developed for one or more varying modes of recreational travel, such as hiking, biking, snowmobiling, horseback riding, cross-country skiing, canoeing and pleasure driving. May include active play areas. (NOTE: any included for any of above components may occur in the "linear park.")	No applicable standard.	Sufficient width to protect the resource and provide maximum use.	Variable	Built or natural corridors, such as utility rights-of-way, bluff lines, vegetation patterns, and roads, that link other components of the recreation system or community facilities, such as school, libraries, commercial areas, and other park areas.
Special Use	Areas for specialized or single purpose recreational activities, such as golf courses, nature centers, marinas, zoos, conservatories, arboreta, display gardens, arenas, outdoor theaters, gun ranges, or downhill ski areas, or areas that preserve, maintain, and interpret buildings, sites, and objects of archeological significance. Also plazas or squares in or near commercial centers, boulevards, parkways.	No applicable standard.	Variable depending on desired size.	Variable	Within communities.
Conservancy	Protection and management of the natural/cultural environment with recreation use as a secondary objective.	No applicable standard.	Sufficient to protect the resource.	Variable	Variable, depending on the resource being protected.

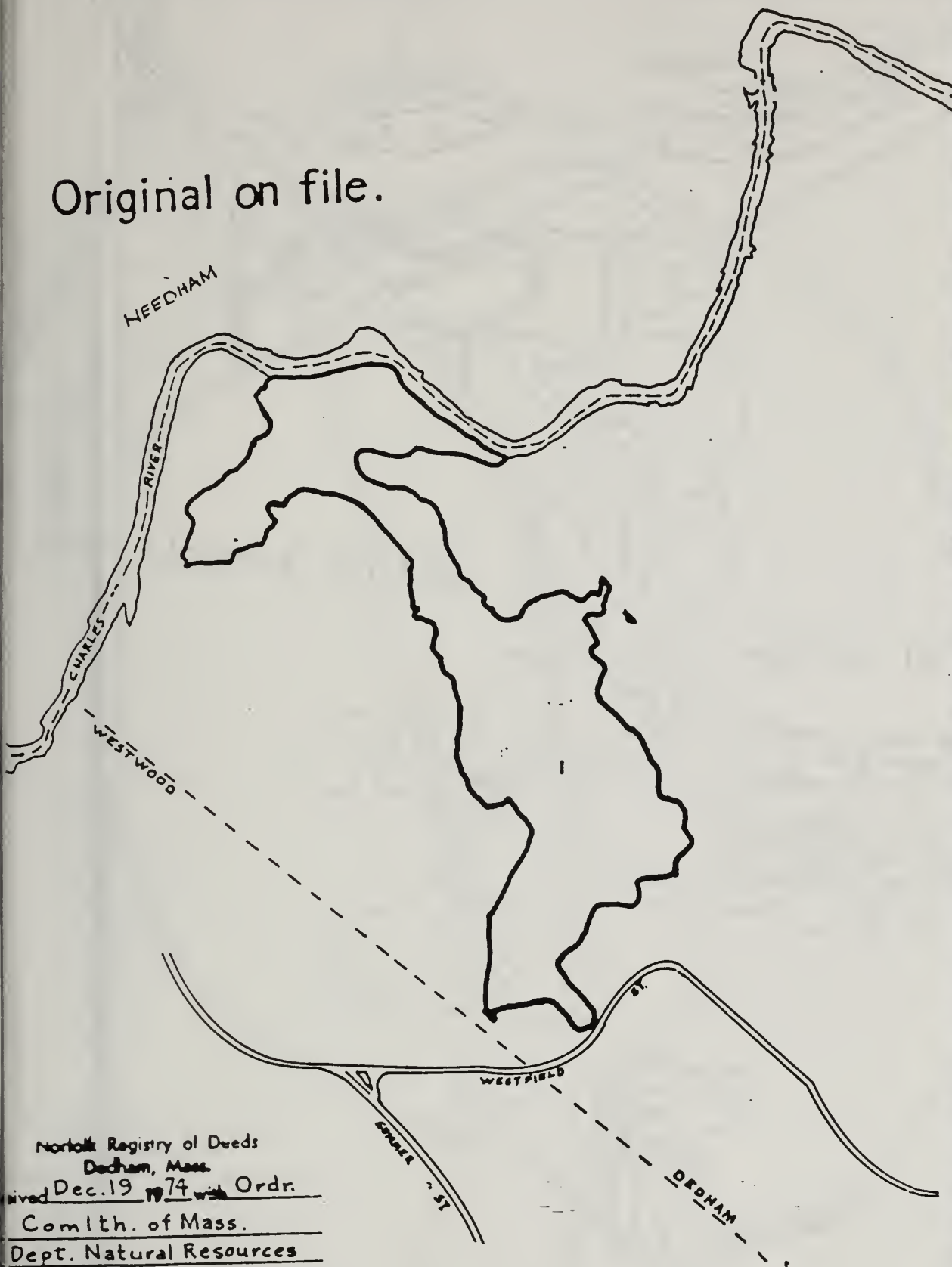


APPENDIX E
MAPS OF WETLANDS RESTRICTIONS



Watershed	Watershed Area (Acres)	Number of Wetland Areas		Wetland Area (Acres)	% Wetland To Watershed
		Complete	Partial		
A ROCK MEADOW BROOK	470	2	-	60.6	12.9%
B CHARLES RIVER	2430	20	1	377.2	15.5%
C LOWDER BROOK	1815	11	-	200	11.0%
D NEPONSET RIVER	1015	6	-	272.6	26.9%
E MOTHER BROOK	645	0	-	-	-
F NORTHWEST CORNER	220	1	1	7.8	3.5%
G PURGATORY BROOK	185	0	-	-	-
TOTALS	6780 Acres	40	1	918.2 Acres	13.8%

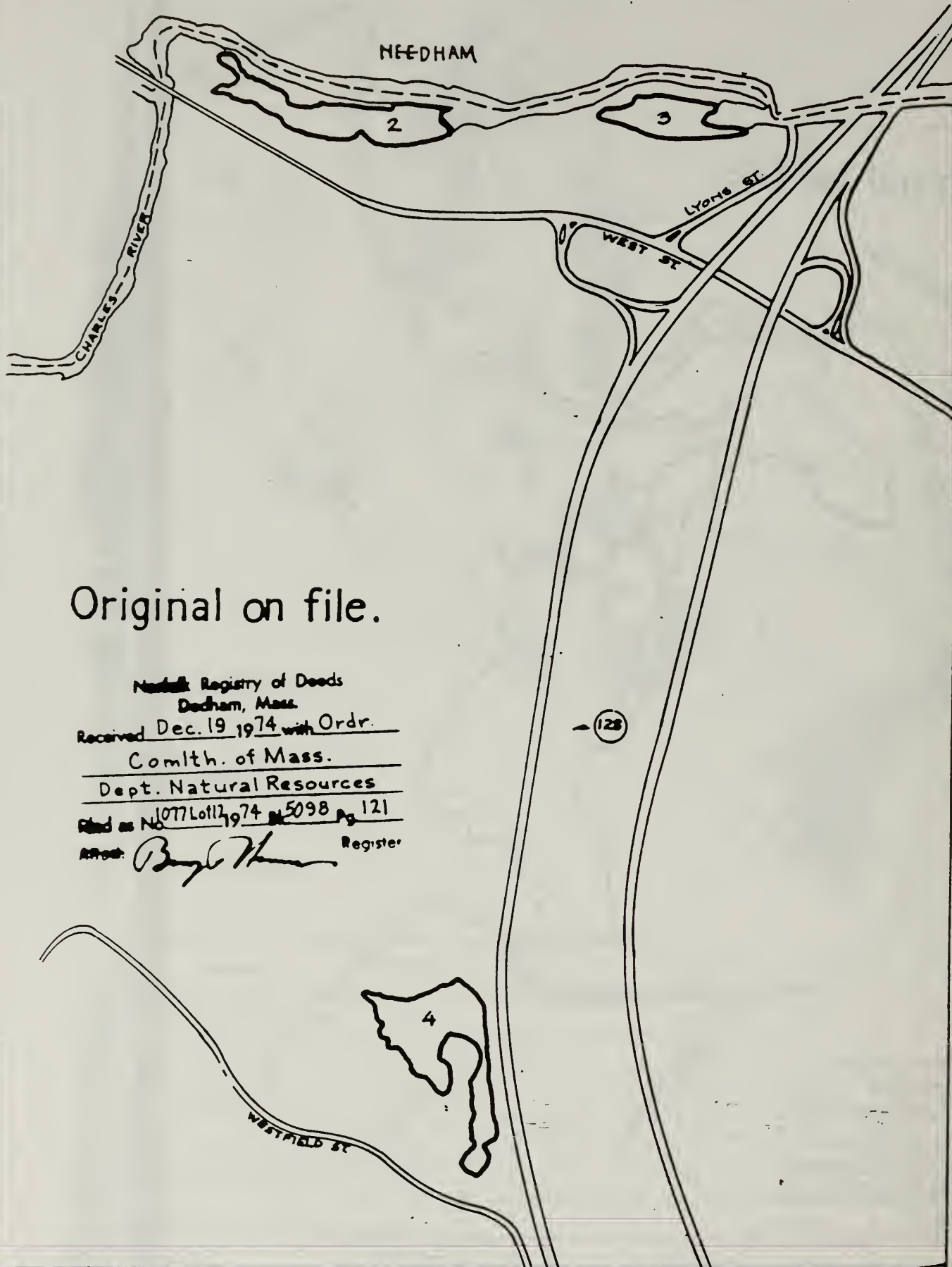
Original on file.



Norfolk Registry of Deeds
Dedham, Mass.
dated Dec. 19 1974 with Ordr.
Comlth. of Mass.
Dept. Natural Resources
Law No. 1077J of 12/74 at 5098 pg 121
By *Raymond J. Hanna* Registrar

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
121 & 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 1



Original on file.

Norfolk Registry of Deeds
Dedham, Mass.
Received Dec. 19 1974 with Ordr.
Comth. of Mass.
Dept. Natural Resources
Filed as No. 1077 Lot 12 1974 at 5098 Pg. 121
Attest: *Beryl Thorne* Register

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
G. L. c. 131 & 40A RESTRICTIONS

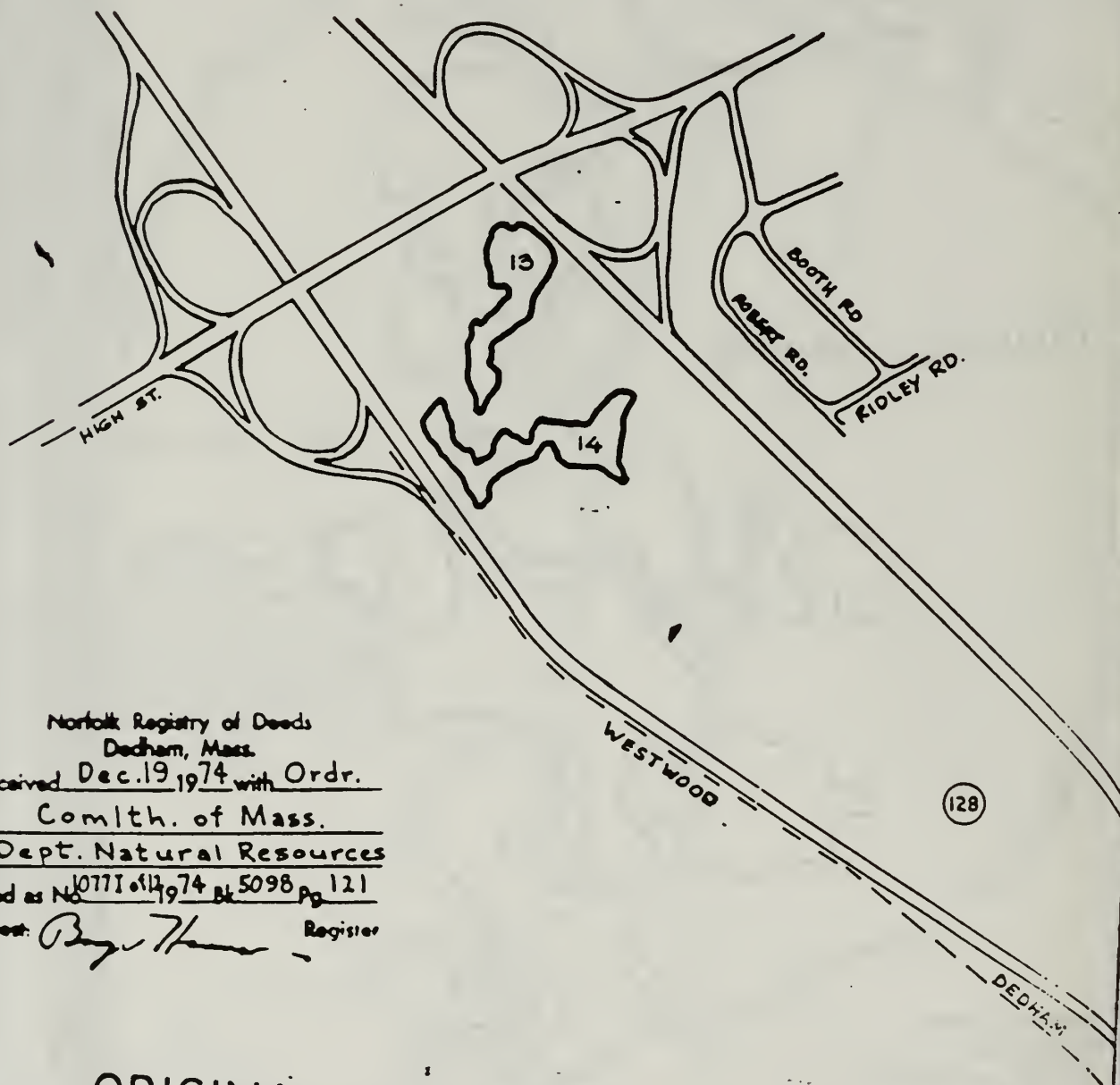
MUNICIPALITY: DEDHAM
WETLAND AREA(S): 2, 3, 4
DATE ADOPTED: NOV. 14, 1974



Norfolk Registry of Deeds
 Dedham, Mass.
 Received Dec. 19 1974 with Ord.
 Comlth. of Mass.
 Dept. Natural Resources
 Filed as No. 10778 of 12/19/74 Bk 5098 pg 121
 Attest: *Beryl Hannon* Register

COMMONWEALTH OF MASSACHUSETTS
 DEPARTMENT OF NATURAL RESOURCES
 . c. 131 § 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
 WETLAND AREA(S): 5, 6, 7, 8, 9, 10
 11 12 42



Norfolk Registry of Deeds
Dedham, Mass.
Received Dec. 19 1974 with Ordr.
Comth. of Mass.
Dept. Natural Resources
Filed as No. 10771 of 12, 74 Bk. 5098 Pg. 121
Attest: Bay Thorne Register

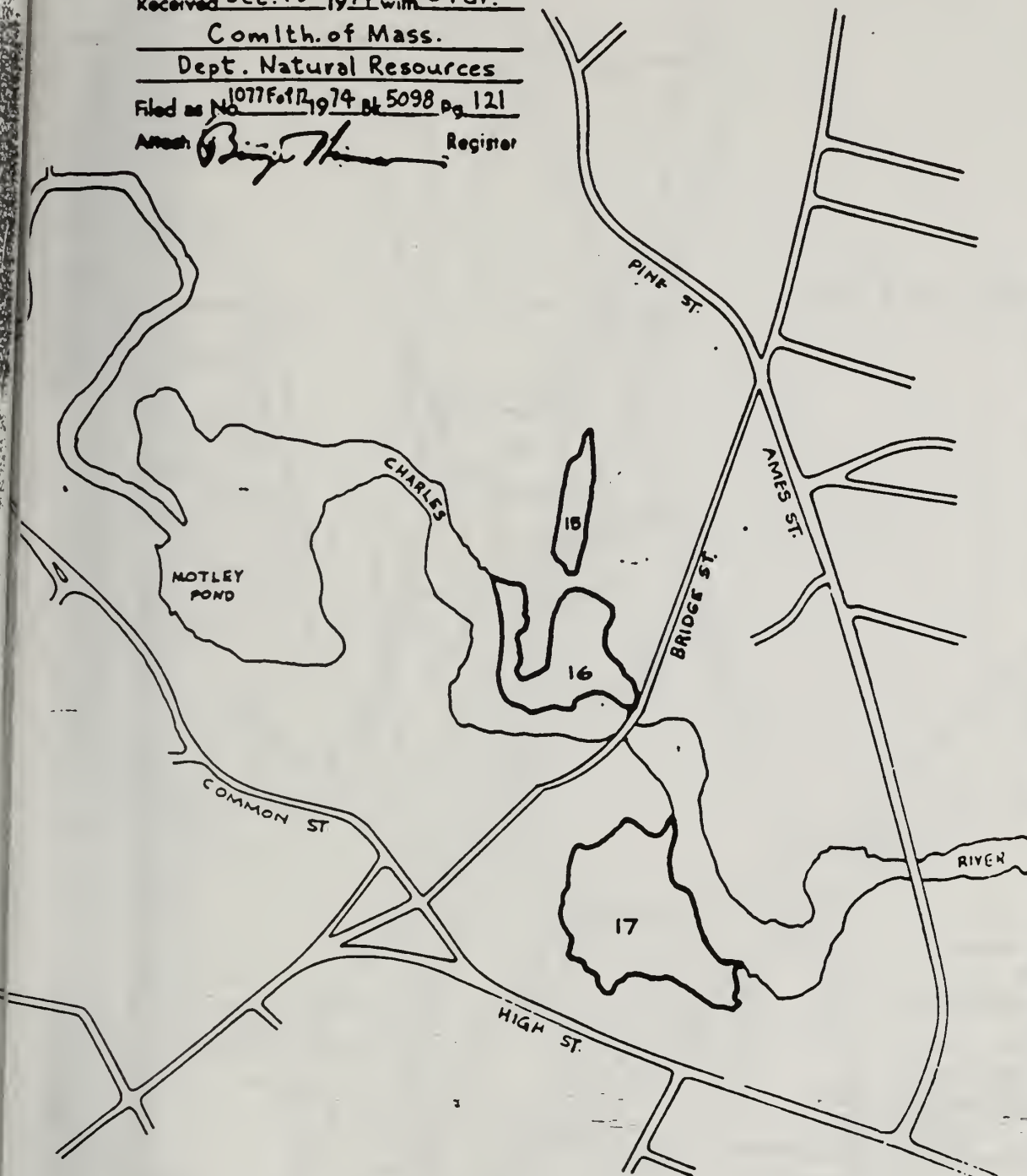
ORIGINAL ON FILE.

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
G. L. c. 131 § 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 13, 14
DATE ADOPTED: NOV. 14, 1974

Original on file.

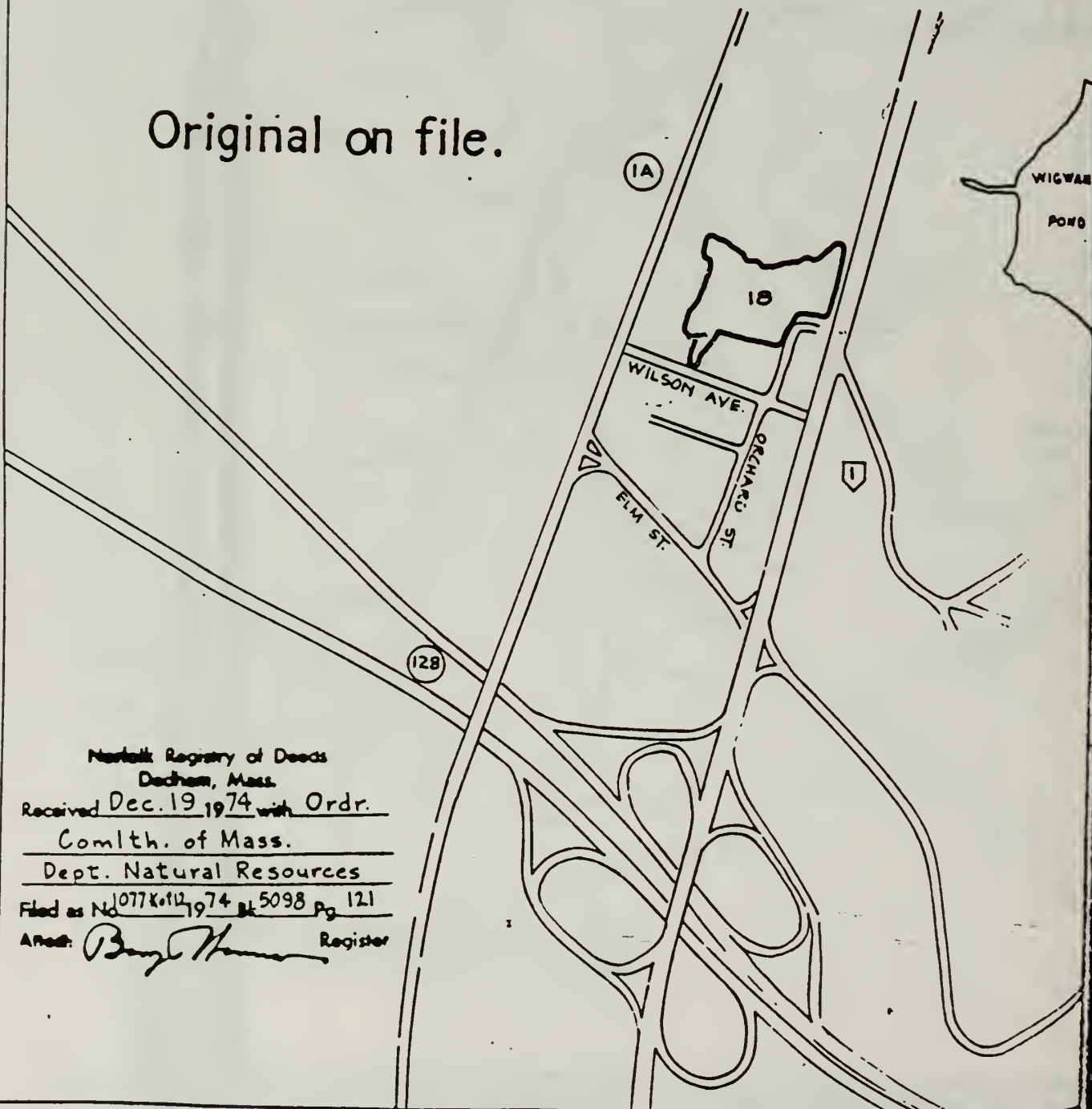
Norfolk Registry of Deeds
Dedham, Mass.
Received Dec. 19 1974 with Ordr.
Comlth. of Mass.
Dept. Natural Resources
Filed as No. 1077F of 12 1974 Bk. 5098 pg. 121
Attest Bing Th... Register



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
§ 131 & 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 15, 16, 17
DATE ADOPTED: NOV. 14, 1974

Original on file.

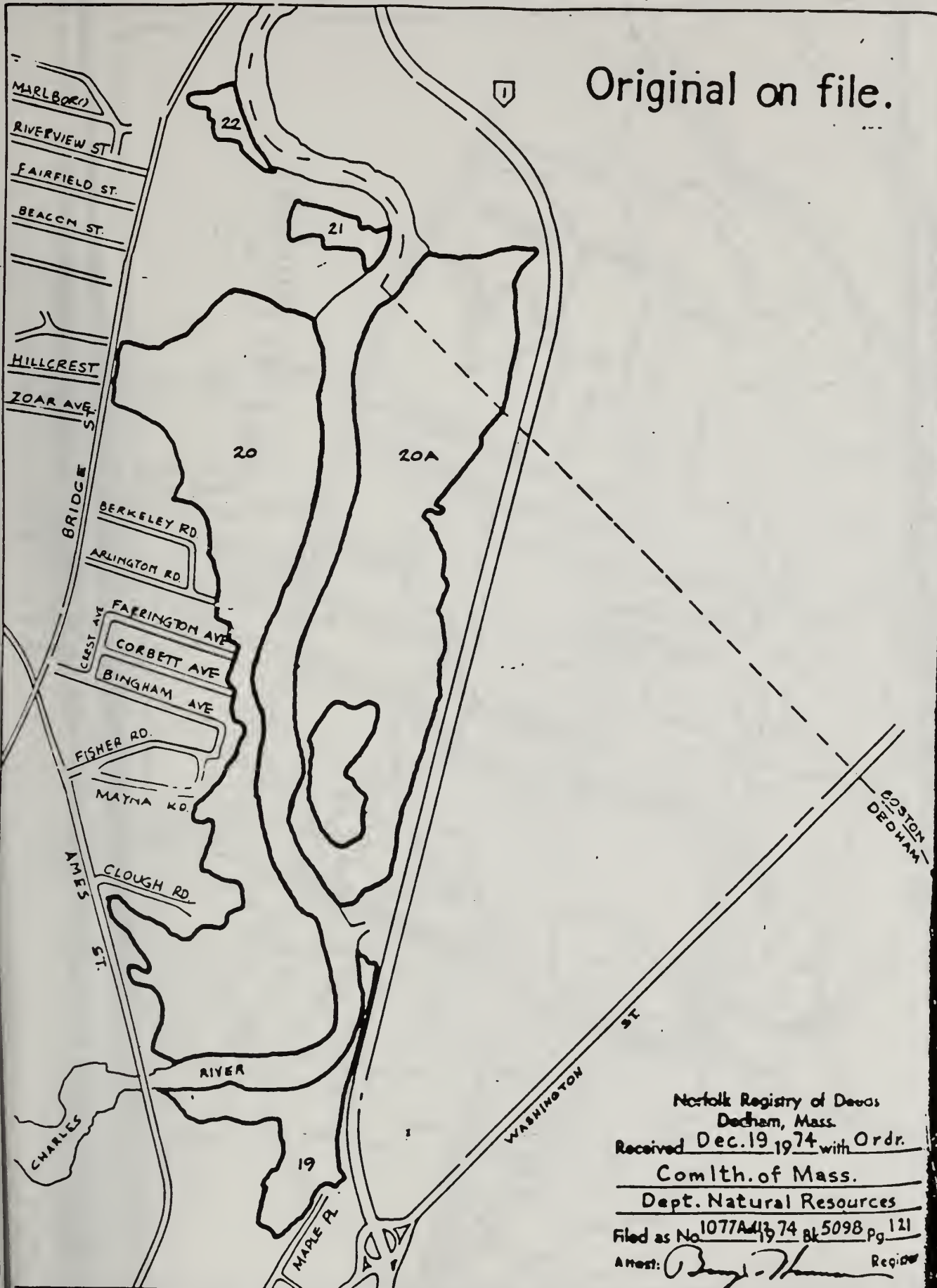


Marble Registry of Deeds
Dedham, Mass.
Received Dec. 19 1974 with Ordr.
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Dept. Natural Resources
Filed as No. 1077K.112 1974 Bl. 5098 Pg. 121
Attest: *B. J. Thomas* Register

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
101-5-101 RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 1B

Original on file.



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
G. L. c. 131 § 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 20, 20A, 21, 22.

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Dept. Natural Resources
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Attest: *B. J. Thorne* Register

Norfolk Registry of Deeds
Dedham, Mass.
Received Dec. 19, 1974 with Ord.

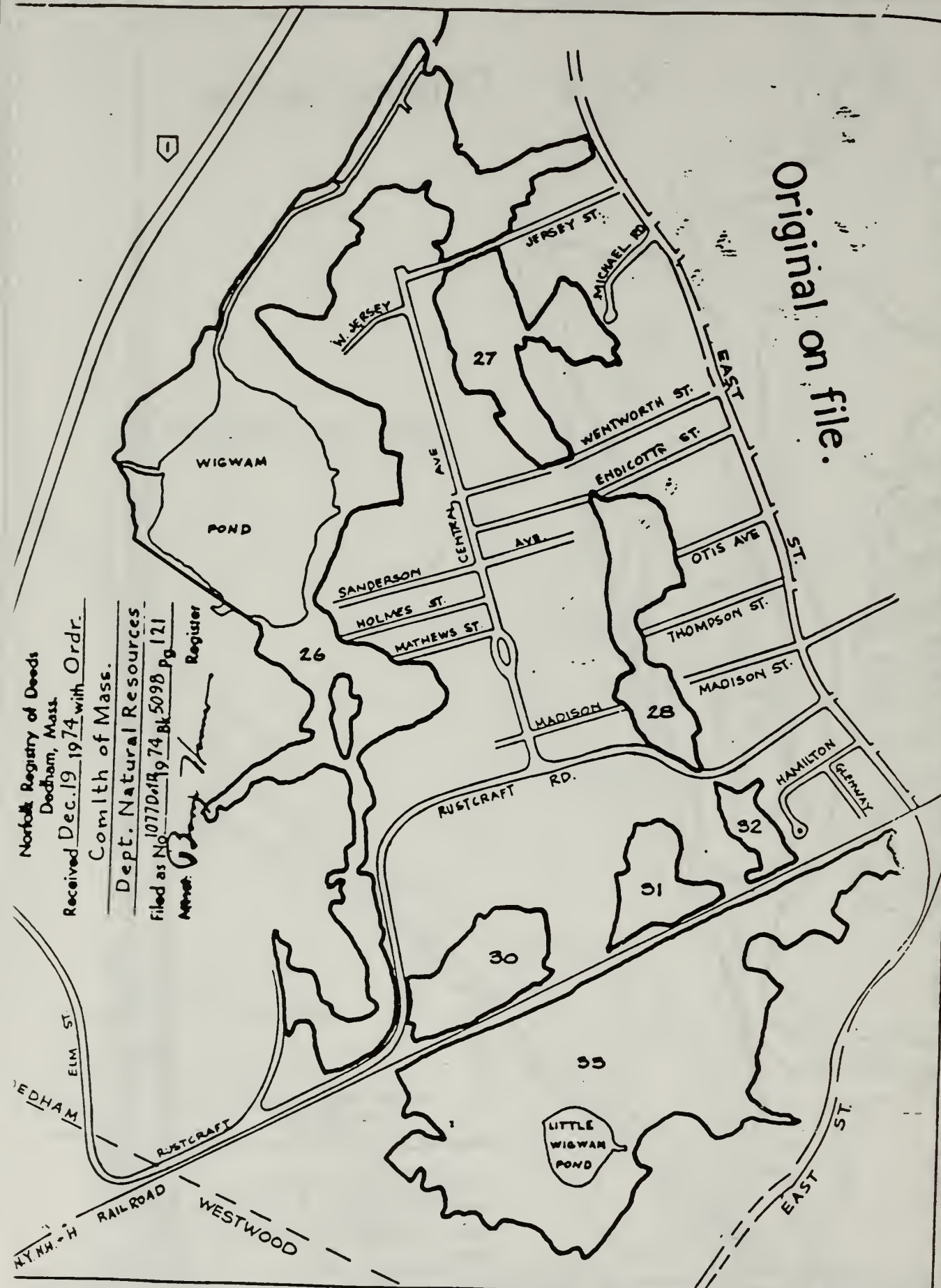
Comlth of Mass.

Dept. Natural Resources

Filed as No. 1077D-19, 74 Bk 5098 pg 121

Attest: *[Signature]* Register

Original on file.



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES

MUNICIPALITY: DEDHAM

WETLAND AREA(S): 26, 27, 28,

Original on file.

Norfolk Registry of Deeds
Dedham, Mass.

Received Dec. 19 1974 with Ordr.

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Dept. Natural Resources

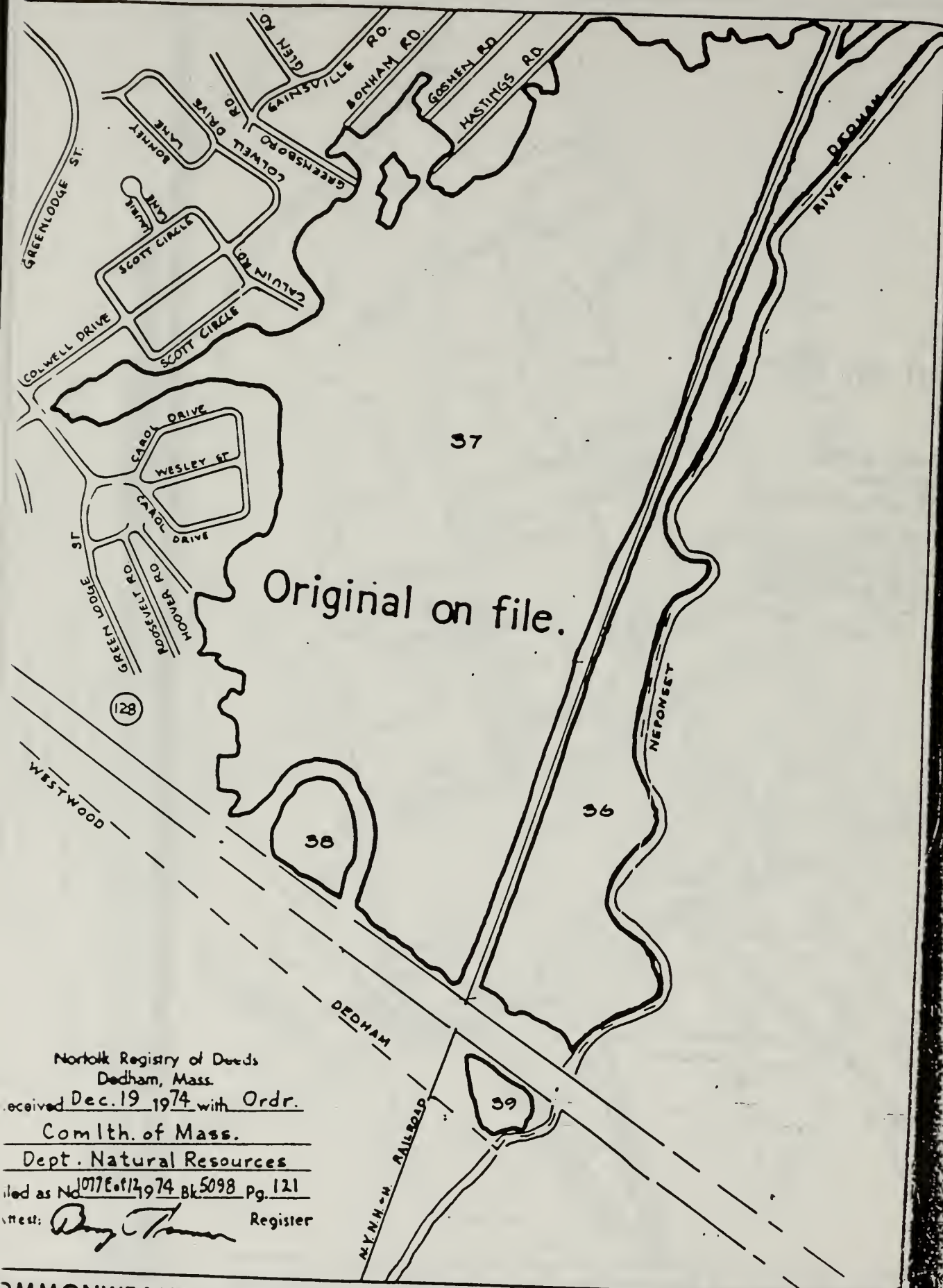
Filed as No. 10776412 1974 Bk 5098 Pg 121

Attest: Bryce Thorne Register



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
107 & 108 RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREAS: 34, 35, 36, 37
DATE ADDED: NOV 14 1974



Norfolk Registry of Deeds
Dedham, Mass.
received Dec. 19, 1974 with Ordr.
Com'lth. of Mass.
Dept. Natural Resources
Filed as No. 1077 E of 14974 Bk 5098 Pg. 121
Invest: *Ray Thomas* Register

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 36, 37, 38, 39

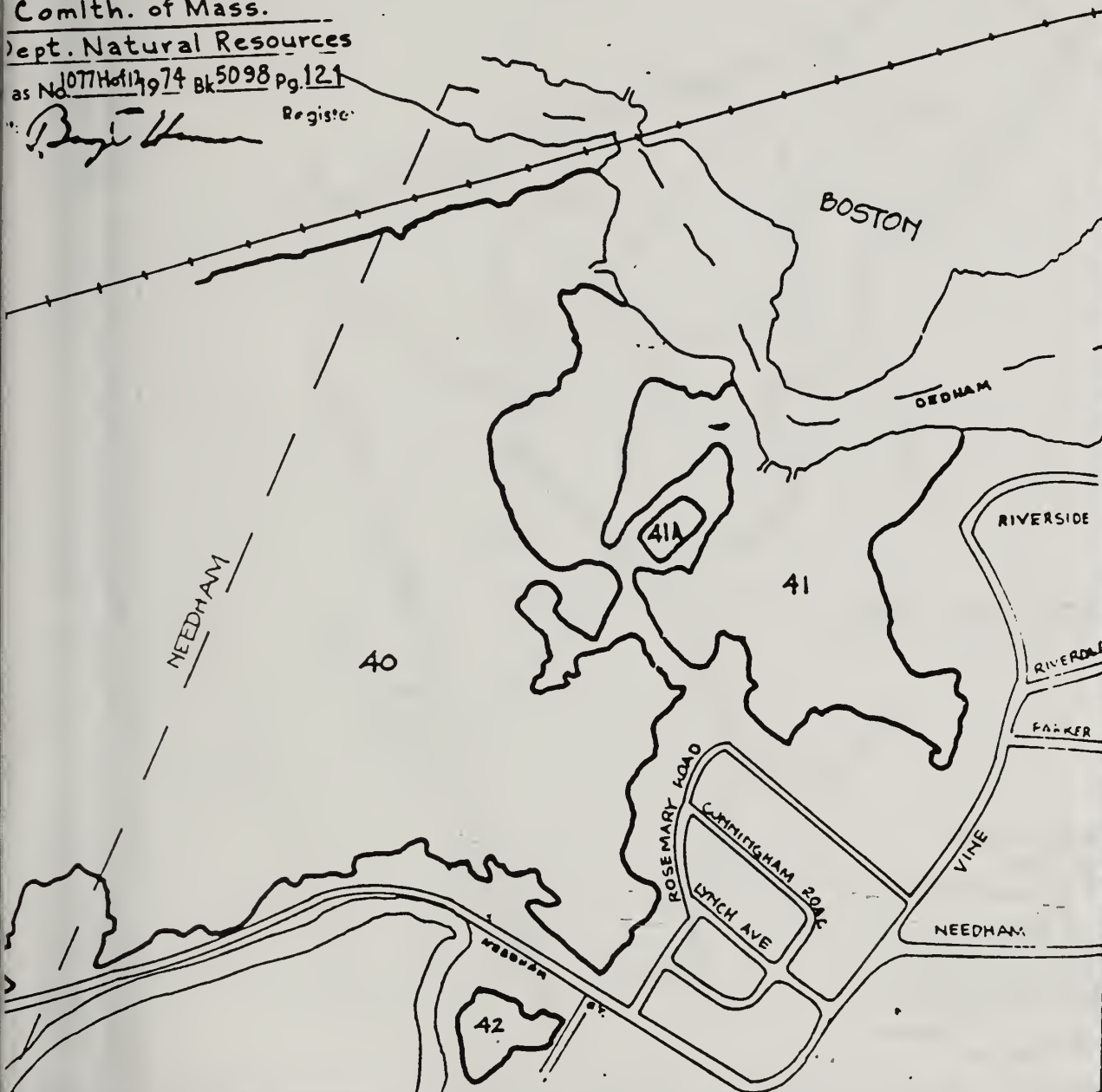
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Norfolk Registry of Deeds
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Dept. Natural Resources

as No. 1077Hd114 1974 Bk 5098 Pg. 121

Bayle Register



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
c. 131 § 40A RESTRICTIONS

MUNICIPALITY: DEDHAM
WETLAND AREA(S): 40, 41, 42
DATE ADOPTED: NOV. 14, 1974



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Dedham, Mass.

Received Dec. 19 1974 with Ordr.

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Dept. Natural Resources

Filed as No. 1077 Cd 179 74 Bl 5098 Pg 121

Attest: *B. J. [Signature]* Register

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF NATURAL RESOURCES
G. L. c. 131 § 40A RESTRICTIONS

MUNICIPALITY: DEDHAM

WETLAND AREA(S): 43

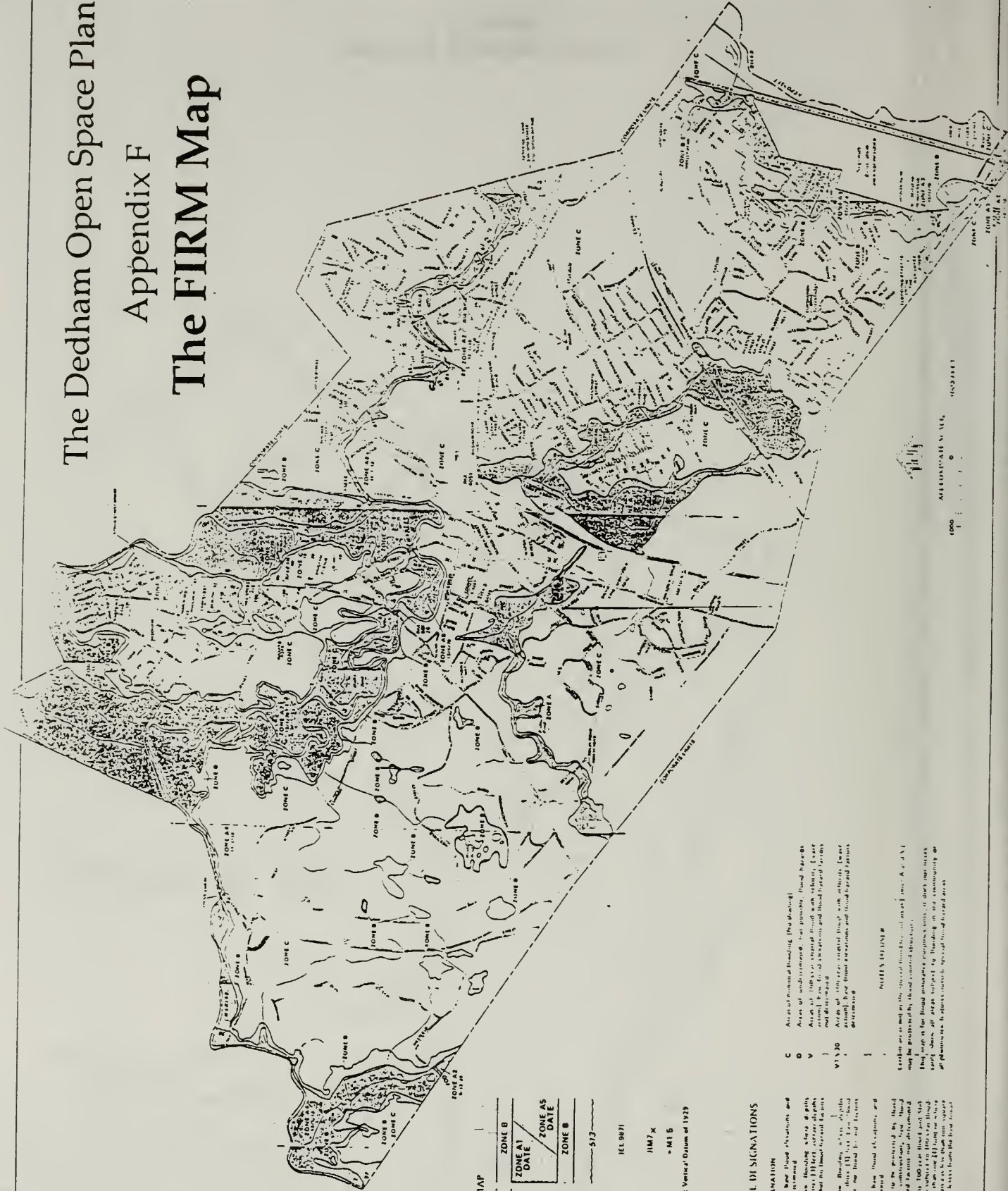
DATE ADOPTED: NOV. 14, 1974

APPENDIX F
FLOOD INSURANCE RATE MAP

The Dedham Open Space Plan

Appendix F

The FIRM Map



KEY TO MAP

500 Year Flood Boundaries	Zone A1
100 Year Flood Boundaries	Zone A2
Zone A1 and A2 with Date of Issuance	Zone A3
100 Year Flood Boundaries	Zone B1
500 Year Flood Boundaries	Zone B2
Base Flood Elevation Line With Elevation in Feet**	Zone C1
Base Flood Elevation in Feet	Zone C2
Water Uniform Reference Zone	Zone X1
Elevation Reference Mark	Zone X2
River Mile	Zone X3

**Reference to the National Geographic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined
A1	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
A2	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
A3	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
B	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
B1	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
B2	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
C	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
C1	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
C2	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
X	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
X1	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
X2	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet
X3	Areas of High Water Flood, Base Flood Elevation and Flood Hazard Factor not determined, but with a 100 Year Flood Elevation of 12.174 feet

1000
500
0
500
1000
Feet

[illegible]

500-Year Flood Boundary

100-Year Flood Boundary

Zone A1 DATE / Zone A2 DATE

Zone B

100-Year Flood Boundary

500-Year Flood Boundary

Base Flood Elevation Line

512

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044

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